



CODED-WIRE TAGGING OF WILD COHO SALMON (Oncorhynchus kisutch)  
STOCKS IN SOUTHEASTERN ALASKA, 1983-1984

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## ADF&G TECHNICAL DATA REPORTS

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Division of Commercial Fisheries

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## ABSTRACT

Wild coho salmon (*Oncorhynchus kisutch*) that were tagged as juveniles and smolts at 13 locations in Southeastern Alaska in 1981 and 1982 returned from the ocean as adults in 1983. Tags were recovered from commercial and sport catches and escapements. Resulting data was analyzed to estimate escapement, fishery contribution by area and gear type, harvest rates, migratory timing, survival rates, and juvenile abundance. Harvest rate estimates for ten study systems ranged from 37.5% to 87.8%. Upper Lynn Canal stocks received by far the greatest fishing pressure with total estimated harvest rates of 85-90%. The primary reason for these high harvest rates compared with other stocks was an intensive fall drift gillnet fishery in Lynn Canal which removed an estimated 60% and 74%, respectively, of available coho salmon returning to Chilkoot and Chilkat Lakes. In addition, the freshwater sport fishery in the Chilkoot River drainage removed an estimated 39% of fish that entered the river. Estimated 1983 harvest rates by the fisheries in outside waters were at, or above, previous records for the seven northern study systems, and below 1982 estimates for the three southern systems. For Lynn Canal and Stephens Passage stocks, most of the increase in harvest rates in outside waters occurred north of Cape Spencer, primarily in District 116, where the troll fishery harvested approximately 25% of the total return to Lynn Canal. The estimated percentage harvested by the Alaska troll fishery of total returns ranged from 29.1% for Auke Lake to 52.2% for Ford Arm Lake, and averaged 41.4%. The estimated percentage harvested by purse seine gear ranged from 0% for the Berners River and Politofski Lake to 23.8% for Warm Chuck Lake (average 7.8%). The estimated percentage harvested by drift gillnet gear ranged from 0% for outer coastal stocks to 36.2% for Chilkat Lake (average 9.5%). The estimated marine sport harvest of northern inside area stocks ranged from 0% for upper Lynn Canal systems to 5.3% for Auke Lake (average 1.6%). Canadian fisheries harvested an estimated 5.9% and 6.8%, respectively, of total coho salmon returns to Hugh Smith Lake in 1982 and 1983. There were no Canadian tag recoveries from other wild stocks in Southeastern Alaska during those years. Most tagged stocks exhibited relatively central migratory timing distributions in major northern and outside troll fishing areas. Exceptions were the early migrating Politofski Lake stock which peaked in mid to late July and the late migrating Auke Lake and Lynn Canal stocks which peaked in late August and September. Future management and research needs are discussed.

KEY WORDS: Coho salmon, *Oncorhynchus kisutch*, coded-wire tag, migration patterns, migratory timing, harvest rates, Southeastern Alaska.



## INTRODUCTION

The coho salmon (*Oncorhynchus kisutch*) is an important contributing species to commercial, sport, and subsistence fisheries in Southeastern Alaska. The annual commercial harvest and decade averages since 1983 are shown in Figure 1. The total annual harvest of coho salmon during the most recent 30-year period (1955-1984) averaged 1.2 million fish compared with an average of 1.8 million for the previous 30-year period (1925-1954). A recent stock recovery has occurred and the annual harvest during the most recent 5-year period (1980-1984) has averaged 1.7 million. In recent years, commercial fisheries have accounted for the vast majority of the total harvest, while sport and subsistence fisheries have taken only 3%. An average of 60-70% of the commercial harvest is taken by troll gear, while the remainder is divided in approximately equal proportions between gillnet and purse seine gear.

The majority of coho salmon harvested in Southeastern Alaska are produced in over 2,000 local streams. Important contributions are also made by the Canadian portions of three major transboundary rivers (Stikine, Taku, and Alsek) and by streams along the British Columbia coast.

In order to better understand the migratory nature of coho salmon stocks and the effects of the fishery, a pigment marking study was initiated in 1972 on the Chilkat, Berners, and Taku Rivers in northern Southeastern (Gray et al. 1978) (Figure 2). Juvenile coho salmon were captured in minnow traps and marked with fluorescent pigment. Fishery and escapement sampling was conducted to recover marked fish. The study showed that these important stocks were subjected to heavy fishing pressure with harvest rates exceeding 75%. It was also found that fish returning to Lynn Canal and Stephens Passage were harvested primarily in northern Southeastern as they migrated from outer coastal waters through Icy Strait toward their respective systems of origin. An analysis of migratory timing data showed that Chilkat and Berners River stocks returned relatively late in the season and were highly available to fisheries for a shorter period of time than Taku River stocks which had more protracted timing.

In 1976, pigment marking was replaced by coded-wire tagging as a method of marking wild coho salmon smolts and juveniles. Tagging experiments were repeated on the three previously studied systems and were expanded to several lake systems in northern Southeastern. During 1976-1979, tagging was conducted at Auke, Speel, and Crescent Lakes near Juneau, Chilkoot Lake near Haines, Porcupine Creek near Wrangell, and at several sites along the lower Stikine River (Shaul et al. 1984) (Figure 2).

In 1980, the scope of coded-wire tagging efforts was expanded to include four stocks from the outer coast and a mainland stock near Ketchikan. During 1981, tagging was repeated on these stocks which included: Ford Arm and Politofski Lakes in District 113, Warm Chuck and Klakas Lakes in District 103, and Hugh Smith Lake in District 101. In addition, juveniles were tagged during 1981 at Reflection Lake in District 101, Kegan Lake in District 102, Speel Lake in District 111, and Chilkoot Lake, Chilkat Lake, and the Berners River in District 115. In 1982, smolts were tagged at the outlets of Auke, Hugh Smith, and McDonald Lakes (Shaul et al. 1983). In the spring of 1983 smolts were

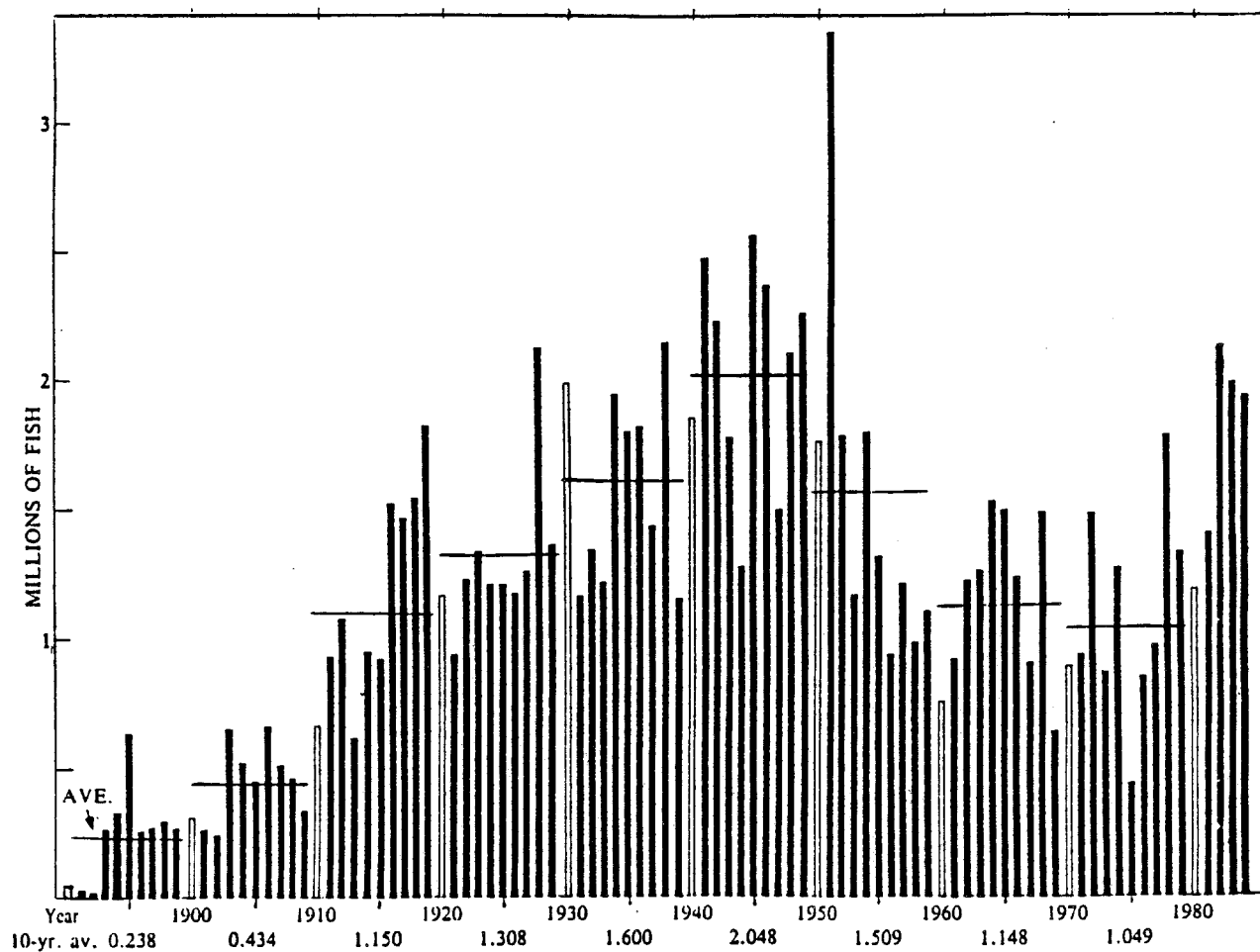


Figure 1. Annual commercial catch of coho salmon in Southeastern Alaska and 10-year averages, in millions of fish, 1890-1984.

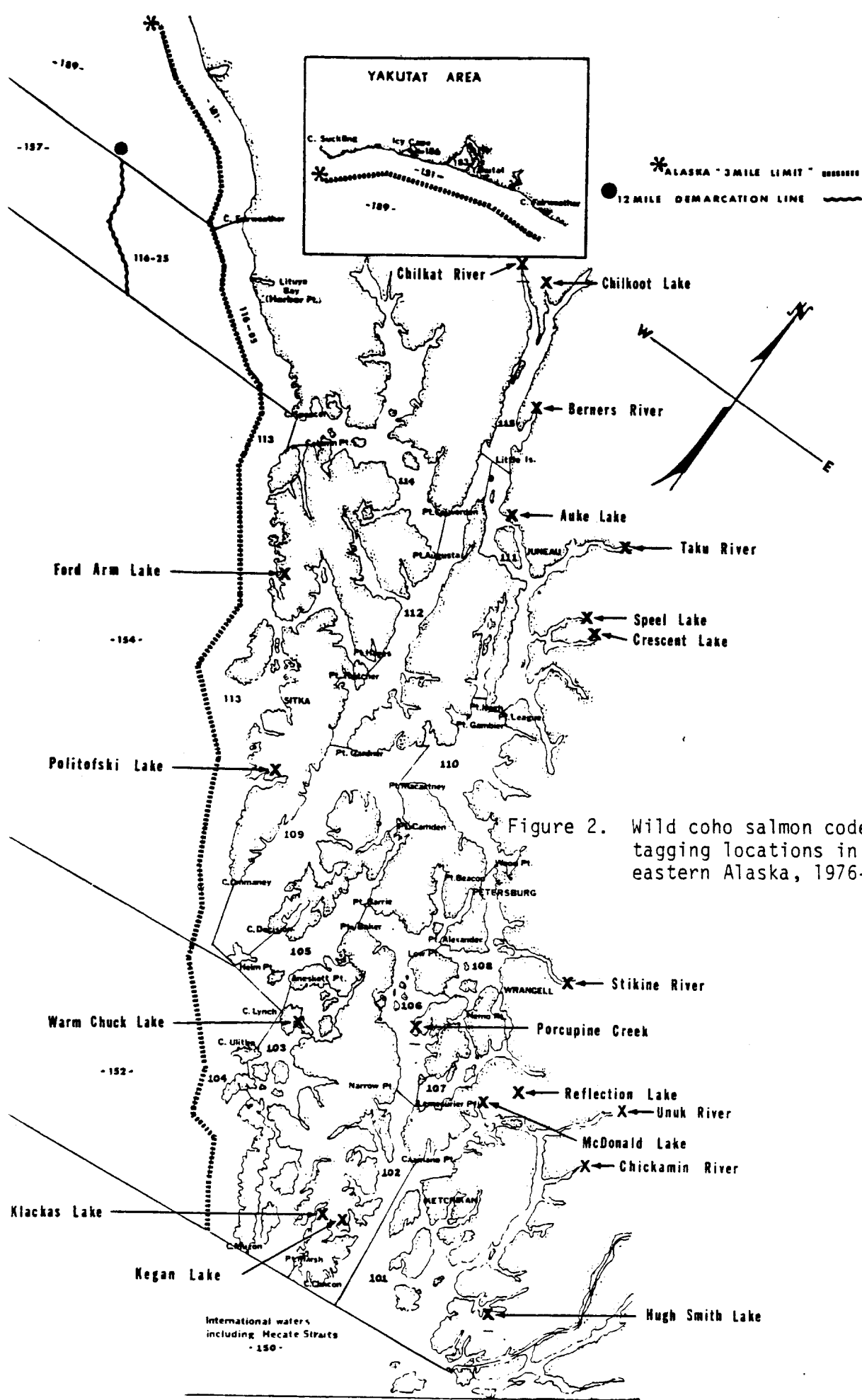


Figure 2. Wild coho salmon coded-wire tagging locations in South-eastern Alaska, 1976-1983.

tagged at Auke Lake, Hugh Smith Lake, and the Chickamin River while juveniles were tagged on the Berners and Chickamin Rivers (Shaul et al. 1984).

The majority of Southeastern Alaska coho salmon that are tagged as age 1+ rearing juveniles return as adults 2 years later (Gray et al. 1981). Most fish tagged as outmigrating smolts return during the year following tagging. Stratified sampling is conducted to recover tags from commercial and sport catches, while tagged fish returning to their streams of origin are sampled and enumerated whenever possible at weir sites and during stream surveys. The result is a broad spectrum of information on the biological characteristics and harvest patterns of specific stocks.

A review and planning workshop on Southeastern Alaska coho salmon research and management was held in Juneau during 18-19 May 1982 (Alaska Department of Fish and Game 1983). The purpose of this meeting was to bring together persons with extensive fisheries background to review the status of coho salmon management and research and to provide recommendations for the future direction of the Coho Salmon Research Project. The foremost of the panel's recommendations was that coded-wire tagging and escapement estimation be conducted annually on a minimum of six systems to determine migration routes, timing, exploitation rates, and escapement. Additional information provided includes: juvenile production per spawner; survival rates between the age 1+ and adult stages; and juvenile population estimates. Over a period of years it is anticipated that such information will be useful in determining, for these index stocks, the selectivity of fisheries among stocks, the effect of various management measures on exploitation rates, and management objectives based on an objective analysis of biological characteristics and population dynamics of individual stocks. In addition, the panel recommended that other stocks be tagged as logistics, opportunities, and available budgets allow in order to determine their migration routes, timing, and differential time-area exploitation.

Subsequent investigations have proceeded along lines recommended by the panel. Currently, six systems being considered as long-term index sites include: Auke Lake, the Berners River, Ford Arm Lake, Warm Chuck Lake, Salmon Bay Lake, and Hugh Smith Lake. In addition, the ADF&G Sport Fish Division has begun similar studies at Salmon Lake near Sitka (Schmidt 1984) and plans to study coho salmon stocks in other Southeastern Alaska systems.

#### SMOLT AND JUVENILE TAGGING

A total of 23,498 coho salmon smolts and 49,317 rearing juveniles was coded-wire tagged in eight systems in Southeastern Alaska during 1 July 1983 - 30 June 1984. These systems included: Auke and Speel Lakes in Stephens Passage; the Berners River in Lynn Canal; Ford Arm Lake on the central outside coast; Warm Chuck Lake on the southern outside coast; the Unuk and Chickamin Rivers in Behm Canal; and Hugh Smith Lake in Boca de Quadra (Figure 2). The number of fish tagged and the code used at each location are listed in Table 1. Most surviving age 1+ juveniles tagged in 1983 will return as adults in 1985. Juveniles tagged on the Unuk and Chickamin Rivers during the spring of 1984

Table 1. Summary of coded-wire tagging of wild coho salmon in Southeastern Alaska, 1 July 1983 - 30 June 1984.

Location	Dates	Number Tagged	Code	Adult Return Year
Speel Lake	7/29-8/4 9/2-8	9,801 juveniles	4-23-22(5,334) 4-22-49(4,467)	1985 1985
Ford Arm Lake	8/15-26	3,882 juveniles	4-23-23	1985
Warm Chuck Lake	9/11-10/4	4,735 juveniles	4-23-26	1985
Unuk River <sup>1</sup>	10/5-11/17 3/16-4/28	11,783 juveniles	4-20-60 (5,696) 4-21-47(6,087)	1985 1985, 1986
Chickamin River <sup>1</sup>	3/17-4/16	3,790 juveniles	4-20-63	1985, 1986
Auke Lake	4/4-6/17	6,751 smolts	3-18-25	1985
Hugh Smith Lake	4/26-5/23	16,747 smolts	4-23-06(5,227) 4-23-07(1,576) 4-23-19(9,944)	1985 1985 1985
Berners River	6/18-29	15,326 juveniles	4-24-34(4,499) 4-24-36(10,827)	1986 1986
Total	72,815 (23,498 smolts and 49,317 juveniles)			

<sup>1</sup> Tagged by the Sport Fish Division Chinook Research Project (see Kissner 1984 and 1985).

may return in 1985 or 1986, depending on whether or not they outmigrated in 1984. Most surviving smolts tagged at Auke and Hugh Smith Lakes in 1984 will return in 1985, while most rearing juveniles tagged on the Berners River in 1984 will return in 1986.

### Methods

Outmigrating smolts were captured for tagging at Auke and Hugh Smith Lakes with smolt weirs that were operated at the outlets of both systems. Wire-mesh minnow traps were used to capture age 1+ and older juveniles on other systems. Fifty traps baited with salmon roe were checked and set four or five times daily at 2-hour intervals at Speel Lake, Ford Arm Lake, Warm Chuck Lake, and the Berners River. Traps were moved frequently to maintain the highest possible catch rates. Juveniles were held in pens before tagging until a total of 1,000 to 4,000 was captured, but not for a period longer than 4 days. On the Unuk and Chickamin Rivers, traps were checked once daily and captured fish were tagged and released daily. Gray et al. (1985) describes the minnow trapping method in detail. Outmigrating smolts captured at smolt weirs were tagged and released daily. A description of the coded-wire tagging technique under field conditions is found in Koerner (1977).

### Summary of Tagging

The following is a brief summary of coded-wire tagging of wild coho salmon stocks, by location, in Southeastern Alaska during 1 July 1983 - 30 June 1984.

#### Speel Lake Juveniles:

A total of 9,801 juvenile coho salmon was trapped and tagged at Speel Lake during 29 July - 4 August and 2-8 September 1983. The length of tagged fish ranged from 62 mm to 142 mm. Of the total number tagged, 3,478 were 62-79 mm, 4,276 were 80-100 mm, and 2,047 were 101-142 mm snout-fork length. Of a total of 5,467 fish captured during the first trip, 133 had missing adipose fins. Fifty-eight of the marked fish were examined for coded-wire tags of which tags were detected in 48. These fish were from a group of 268,074 juvenile coho salmon that were reared in the Snettisham hatchery and released in Second Lake on 25 May. Of the total release group, 40,791 (15.2%) were tagged (code 4-22-32). Therefore, it appeared that a significant percentage of fish stocked in Second Lake migrated into Speel Lake via the Speel River. Approximately 16.0% of rearing age 1+ and older coho salmon in Speel Lake were from this group.

#### Ford Arm Lake Juveniles:

A total of 3,882 juvenile coho salmon was trapped and tagged at Ford Arm Lake during 15-25 August. Catches were poor in the lake and outlet stream, averaging less than one fish per trap, but improved to 4-9 per trap in the small pond near the head of the lake. Overall, catches averaged 4.4 fish per trap. Of the total number tagged, 2,085 were 62-79 mm, 1,430 were 80-100 mm, and 367 were 101-165 mm in length. One fish was recaptured that had been tagged 2 years previously in July 1981.

Several large fish (120-165 mm) that were captured in the lake and adjacent pond displayed the silver coloration and black-tipped fins typical of out-migrating smolts. Scale samples revealed that most of these were age 1+, having spent only one winter in freshwater after emergence. However, the scale patterns showed exceptionally rapid growth during the second summer indicating that they may have returned to the lake after rearing for part of the summer in the estuarine or saltwater environment. Seasonal rearing of juvenile coho salmon in the estuarine ecotone and subsequent overwintering in freshwater has been documented at Kake Bake Creek on Kupreanof Island (Steve Elliott, ADF&G, pers. comm.).

#### Warm Chuck Lake Juveniles:

A total of 4,735 juvenile coho salmon was trapped and tagged at Warm Chuck Lake during 11 September - 4 October. Of that total, 2,760 were 65-79 mm, 1,636 were 80-100 mm, and 339 were 101-130 mm in length. Overall, the catch rate averaged 4.7 per trap.

#### Unuk River Juveniles:

A total of 11,783 juvenile coho salmon was trapped and tagged on the mainstem Unuk River by the Sport Fish Division Chinook Salmon Research Project (Kissner 1984 and 1985). Of that total, 5,696 were captured during 5 October - 17 November 1983, while 6,087 were captured during 16 March - 28 April 1984. Catch rates averaged 2.8 per trap during the first trip and 2.6 per trap during the second trip.

#### Chickamin River Juveniles:

A total of 3,790 juvenile coho salmon was trapped and tagged on the Chickamin River by the Sport Fish Division Chinook Salmon Research Project during 17 March - 16 April (Kissner 1985). Catch rates averaged 2.8 per trap.

#### Auke Lake Smolts:

A total of 7,012 wild coho salmon smolts migrated from the Auke Lake system in 1984, of which 6,751 were tagged and released. Of the tagged smolts, 688 were 100 mm or less, 4,881 were 101 to 130 mm, and 1,182 were greater than 130 mm in length. The first smolts were observed on 4 April, while a steady migration began during the first week of May, and the last smolts were observed on 17 June.

#### Hugh Smith Lake Smolts:

The smolt weir at Hugh Smith Lake was installed on 25 April. One hundred fifty-eight salmon smolts entered the trap during the first day of operation. A total of 21,014 was counted by 23 May, of which 16,916 were tagged and released. Overnight tag retention was estimated at 99.0%. The total number of valid tagged smolts released was estimated at 16,747. The migration peaked in mid May and declined to less than 100 smolts per day by 23 May when the tagging operation was terminated.

### Berners River Juveniles:

A total of 15,326 juvenile coho salmon was trapped and tagged on the Berners River during 18-29 June. Of the total number tagged, 12,328 were 62-79 mm, 2,953 were 80-100 mm, and 45 were 101-116 mm in length. Code 4-24-36 was used for 10,827 fish from the main slough, while code number 4-24-34 was used for 4,499 fish tagged at Det's Pond. The Pond was considerably warmer (ave. 16.0° C) compared with the main slough (ave. 9.2° C). The overall average length of fish tagged at the pond was 79.8 mm (n=323), compared with 70.8 mm (n=755) for the main slough. The average catch rate of 10.6 juvenile coho salmon ( $\geq 62$  mm) per trap was the highest recorded for the Berners River system. Scale samples indicated that nearly all tagged fish were age 1+, with very few age 2+ fish present. No fry (age 0+) over the minimum size for tagging were observed in the samples.

### TAG RECOVERY FROM FISHERIES

Commercial catch sampling for coded-wire tagged coho salmon was conducted by the ADF&G Statewide Stock Biology Group which had samplers stationed at fish processors and buying stations located throughout Southeastern Alaska. The samplers watched for adipose clipped coho salmon during off-loading and sorting operations. Skippers of fishing vessels and tenders were interviewed to determine fishing areas (Appendix Figures 1-4). The heads of all adipose clipped fish were sent to the ADF&G Coded-wire Tag Lab in Juneau for removal and decoding of tags. Areas used in expanding random recoveries were the nine Pacific Marine Fisheries Commission (PMFC) area groupings of regulatory districts shown in Appendix Table 1. Time strata used were statistical weeks (Appendix Table 2). Randomly recovered tags were expanded by the inverse of the proportion of the catch that was sampled within area, gear type, and weekly strata.

The ADF&G Sport Fish Division conducted a creel census and survey of the Juneau area marine recreational fishery (Neimark 1984). Interviewers examined 2,463 coho salmon for missing adipose fins out of a total estimated catch of 12,662. Because weekly catch estimates were not available, tags recovered from random samples were expanded to the total season's catch. A creel census was conducted at Ketchikan through the first week of July. A total of 386 coho salmon were sampled out of an estimated catch of 4,010 for that period. The expansion for the Ketchikan sport fishery does not account for fish harvested after the first week of July.

A total of 782 coded-wire tagged wild Southeastern Alaska coho salmon was recovered from area-specific commercial and sport catches in Southeastern Alaska and British Columbia in 1983. Information from these recoveries is presented in Appendix Tables 3-14. Expansion factors reported for British Columbia recoveries by the Canadian Department of Fisheries and Oceans are preliminary.



## ESCAPEMENT ENUMERATION AND SAMPLING

Coho salmon escapements were enumerated, or estimated, and sampled on ten systems in Southeastern Alaska during 1983. All or a portion of the escapement to each system was examined for missing adipose fins and the presence of coded-wire tags. In addition, the Kegan Lake weir was operated during 20 June - 12 September, which encompassed only the early portion of the adult coho salmon migration. Escapement figures and tagged-untagged ratios for each system are shown in Table 2.

### Auke Creek Weir

The first adult coho salmon of the season were counted through the Auke Creek weir on 20 September. The peak daily count of 272 occurred on 21 September. The last adult was counted on 28 October and the weir was removed on 9 November. The total season's count of wild coho salmon was 694 adults and 310 jacks<sup>1</sup>. Of those, a total of 630 adults and 261 jacks were found to have clipped adipose fins. Of a total of 94 adults that were examined, 90 had coded-wire tags for a tag retention rate of 97.5%. The 1983 wild coho salmon escapement to Auke Lake and escapements during other years are shown in Appendix Table 15.

### Speel Lake Weir

The Speel Lake weir was operated during 1 July - 9 November. The first adult coho salmon were counted on 3 September. The peak daily count of 145 adults occurred on 8 October, and a total of 1,797 adults and 69 jacks were counted before the weir was removed. A total of 1,774 adults was examined, of which 361 had missing adipose fins. Of a total of 178 marked adults that were examined, 165 had coded-wire tags for a retention rate of 92.7%. Of the recovered tags, 161 had been implanted in rearing juveniles at Speel Lake in 1981, while four had been implanted in 1980.

### Berners River Surveys

A total of 9,840 adult coho salmon was counted during a float and foot survey of the Berners River during 26 October - 4 November. The majority of fish were found in aggregations of up to 2,000 in deep pools. The 1983 ground and aerial surveys revealed the highest escapement ever recorded for the Berners River (Appendix Table 16).

A total of 1,366 fish was captured in seines and dipnets, of which 21 (1.5%) were missing adipose fins. Of those, all contained coded-wire tags implanted in juvenile coho salmon on the Berners River in 1981.

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<sup>1</sup> Age .0 males.

Table 2. Total adult escapement and estimated number of coded-wire tagged wild coho salmon escaping to systems in Southeastern Alaska, 1983.

System	Adult Escapement	95% Confidence Limits	Number Examined For Marks	Number Marked	Estimated Tagged Adults in Escapement <sup>1</sup>
Auke Lake	694	Complete Count	694	630	603
Speel Lake	1,797	Complete Count	1,774	361	339
Berners River	9,840	Survey Count	1,366	21	151
Chilkoot Lake	1,733 <sup>2</sup>	Complete Count	1,682	58	51
Chilkat Lake	1,028	--- <sup>3</sup>	1,028	7	7
Ford Arm Lake	1,944 <sup>4</sup>	1,594-2,294	804	87	195
Politofski Lake	732	Complete Count	596	86	106
Warm Chuck Lake	1,238	Complete Count	1,238	41	35
Klakas Lake	1,328	Complete Count	1,328	53	41
Hugh Smith Lake	1,490 <sup>5</sup>	-	1,160	292	353
Kegan Lake	--- <sup>6</sup>	-	1,089	7	-

<sup>1</sup> Adjusted for tag loss.

<sup>2</sup> Weir count. Includes fish that were subsequently harvested upstream of the weir.

<sup>3</sup> The escapement to Chilkat Lake may have been under estimated (see text).

<sup>4</sup> Peterson estimate of the population upstream of the weir plus weir mortalities, coded-wire tag retention samples, and fish remaining downstream when the weir was removed.

<sup>5</sup> Mark-recapture estimate based on the method presented by Schaefer (1951) plus weir mortalities, coded-wire tag retention samples, and fish remaining downstream when the weir was removed.

<sup>6</sup> Only a partial escapement count was obtained at Kegan Lake because the weir was removed before the migration was complete. A total of 1,089 adults was counted through 12 September.

### Chilkoot Lake Weir

The Chilkoot Lake weir was operated during 4 June-13 November. The first coho salmon were counted on 8 September. The peak daily count of 124 occurred on 6 October, and the last fish passed the weir on 9 November. Four adults were seen behind the weir when it was removed. The total escapement count to the system was 1,733 adults and 11 jacks. A total of 1,682 adults was examined, of which 58 had missing adipose fins. Of 28 adipose clipped adults that were sampled, 24 had tags that were implanted at Chilkoot Lake in 1981, while four had no tags.

### Chilkat Lake Weir

The Chilkat Lake weir was operated during 22 June-13 November. The first coho salmon were counted on 9 September. The peak daily count of 118 occurred on 29 October and the last fish were counted on 12 November. The total season count was 1,028 adults. No jacks were counted at the weir, but several were caught in the lake on sport gear which indicated that they were able to pass between the weir pickets. Of the total adult escapement, only seven fish (0.7%) were marked.

It is possible that a significant proportion of the escapement entered Chilkat Lake after the weir was removed. A total of 2,500 coho salmon was counted in the lower Chilkat River on 6 December. This is one possible explanation for the discrepancy in troll and purse seine harvest estimates for the Chilkat Lake stock compared with the Berners and Chilkoot River stocks (see section titled "Harvest by Gear Type").

### Ford Arm Lake Weir

The Ford Arm Lake weir was operated during 12 August-17 November. The first coho salmon passed the weir on 23 August, and a total of 731 adults was counted before it was removed. A total of 190 adults was counted between the weir and saltwater on 17 November. The peak daily count of 172 adults occurred on 22 September, however, it was suspected that a large portion of the run escaped uncounted when water passed over the weir for an 8-hour period on 20 September. It was possible to estimate the total escapement using the Peterson mark-recapture method since a total of 690 adults was marked at the weir site with Floy anchor tags and accessory adipose fin marks. During 15-17 November, 123 adults were captured above the weir and at the mouth of the main inlet stream using sport fishing gear and dipnets. Of those, 38 had Floy tags, while an additional 11 had secondary marks (clipped rays at the base of the adipose fin) for a tag loss rate of 22.4%. The estimated total escapement to the system was 1,944 (95% C.I. 1,594-2,294). Of a total of 804 adults examined, 87 had missing adipose fins. Twenty-seven adipose clipped fish were examined, of which 24 had been tagged in 1981 while one had been tagged in 1980 and two contained no tags. A total of 97 jacks was counted at the weir.

### Politofski Lake Weir

The Politofski Lake weir was operated during 18 August-15 November. The first coho salmon were counted on 21 August, while the last fish passed the weir on

12 November. A total of 596 adults and 66 jacks was counted during the period of operation. In addition, 136 adults were counted downstream from the weir when it was removed for a total adult escapement count of 732. A total of 596 adults was examined, of which 86 had missing adipose fins. Twenty marked adults were examined, of which 19 had been tagged in 1981, while one had been tagged in 1980.

#### Warm Chuck Lake Weir

The Warm Chuck Lake weir was operated during 19 June-10 November. The first coho salmon were counted on 19 August and the last fish passed the weir on 3 November. The escapement totaled 1,238 adults, of which 41 had missing adipose fins. In addition, 67 jacks were counted. Nineteen marked adults were examined for coded-wire tags. Of those, 15 had tags implanted at Warm Chuck Lake in 1981, one had a tag implanted there in 1980, one was a stray from Deer Mountain hatchery near Ketchikan (code 4-21-48), and two contained no tags.

#### Klakas Lake Weir

The Klakas Lake weir was operated during 8 June-10 November. The first coho salmon were counted on 14 July and a total of 1,328 adults and two jacks was enumerated during the period of operation. Fifty-three of the adults had missing adipose fins of which 18 were examined for tags. Fourteen contained tags implanted at Klakas Lake in 1981 while four contained no tags.

#### Hugh Smith Lake Weir

The Hugh Smith Lake weir was operated during 1 June-30 November. The first coho salmon were counted on 2 August, while 17 remained behind the weir when it was removed. A total of 1,167 adults and 63 jacks was counted during the period of operation, however, the weir was in operation for approximately 45 hours during 25-27 September because of extreme high water conditions. The total escapement was estimated using the mark-recapture technique. Floy tags and secondary adipose fin marks were applied to 1,117 adults throughout the migration at the weir. A total of 192 adults was recaptured at the inlet streams during 23 October-29 November and 11-13 January. Of those, 105 had Floy tags while 42 had secondary marks indicating a tag loss rate of 28.6%. Using a stratified method developed by Schaefer (1951), and applied to estimate the Hugh Smith Lake escapement in 1982 (Shaul et al. 1984), the 1983 escapement was estimated at 1,490. Of 1,160 adults examined for marks, 292 had missing adipose fins. Fifty-two marked adults were examined for tags, of which 12 were tagged as juveniles in 1981, and 37 were tagged as smolts in 1982, while three contained no tags.

#### Kegan Lake Weir

The Kegan Lake weir was operated during 20 June-12 September. A total of 1,089 adults passed the weir during the period of operation, of which 22 had missing adipose fins.

## HARVEST BY GEAR TYPE

The estimated total return, harvest by gear type, and escapement of coho salmon returns to 10 study systems in Southeastern Alaska in 1983 and prior years are shown in Tables 3-12.

The 1983 total return to Auke Lake, harvest rate, and distribution of the catch among gear types were about average for previous studies of that stock (Table 3). The troll fishery took an estimated 29.1% of the total return, while the purse seine, drift gillnet, and sport fisheries accounted for 0.9%, 2.2%, and 5.3%, respectively, for an overall estimated harvest rate of 37.5%. The estimated troll harvest portion fluctuated widely from 49.2% in 1978 to 11.5% in 1980, while more recent estimates appeared to have stabilized at close to 30%. This is probably due largely to the effects of regulations implemented after 1978. Trolling in northern inside and intermediate waters was severely restricted and a 10-day troll closure was placed in effect in 1980. Since then, the fleet has adjusted by fishing more in outside waters. The purse seine catch of Auke Lake coho salmon was significant only in 1982 when the purse seine fishery operated extensively in intermediate passage areas to harvest an exceptionally large pink salmon return. Overall, the harvest rate of Auke Lake coho salmon has remained low-to-moderate since 1978, compared with other stocks. This is apparently due to a combination of factors including a lower availability to outside fisheries compared with other stocks, middle to late timing which lessens the stock's vulnerability to purse seine fisheries, and a home stream located away from major drift gillnet fisheries..

The 1983 total return to Speel Lake, harvest rate, and catch distribution among gear types were also near average for previous studies (Table 4). The troll fishery harvested an estimated 42.2% of the total return, while purse seine, drift gillnet, and sport fisheries accounted for 5.1%, 1.5%, and 1.5%, respectively. In common with Auke Lake, the Speel Lake stock showed a similar trend of substantially reduced troll harvest rates immediately after 1978, followed by an increase to an intermediate level in 1982 and 1983. The overall harvest rate estimate for the Speel Lake stock in 1983 (50.3%) was a significant reduction from the 1982 estimate of 71.4%. Nearly all of this decrease was accounted for by a reduced harvest by the purse seine fishery which operated very intensively in migration corridor areas in 1982. Of particular interest is the relatively low percentage of the run that has been taken by drift gillnet fisheries (1.5 - 6.7%) in spite of Speel Lake's close proximity to the Taku-Snettisham drift gillnet fishery. Concurrent estimates for Speel Lake and the Taku River in 1978 and 1979 (Shaul et al. 1983) indicate that Taku River stocks receive substantially more drift gillnet effort. Speel Lake is, therefore, not a good indicator of drift gillnet harvest rates and escapements for coho salmon returns to the nearby Taku River. Survival rates and total returns to Speel Lake have been remarkably consistent over 5 study years. Juvenile to adult survival rate estimates ranged from 4.2-5.9%, while total adult return estimates ranged from 3,238-4,076.

The estimated total return to the Berners River of 32,765 coho salmon in 1983 was the highest recorded for that system (Table 5). The escapement of 9,840

Table 3. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Auke Lake, 1978, 1980, 1981, 1982, and 1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Drift Gillnet	Sport	Total Catch	Escapement	Total Return
1978	32	778 (49.2%)	-	29 (1.8%)	90 (5.7%)	897 (56.7%)	683 (43.3%)	1,580 (100%)
1980	11	96 (11.5%)	-	20 (2.4%)	17 (2.1%)	133 (16.0%)	698 (84.0%)	831 (100%)
1981	35	215 (24.4%)	4 (0.5%)	2 (0.2%)	17 (1.9%)	238 (27.0%)	644 (73.0%)	882 (100%)
1982	28	231 (28.8%)	97 (12.0%)	23 (2.9%)	6 (0.7%)	357 (44.4%)	447 (55.6%)	804 (100%)
1983	90	323 (29.1%)	10 (0.9%)	25 (2.2%)	59 (5.3%)	417 (37.5%)	694 (62.5%)	1,111 (100%)
Average Number of Fish		329	22	20	38	409	633	1,042
Average % of Total		28.6	2.7	1.9	3.1	36.3	63.7	100

<sup>1</sup> Includes only expandable random recoveries.

Table 4. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Speel Lake, 1978, 1979, 1981, 1982, and 1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Drift Gillnet	Sport	Total Catch	Escapement	Total Return
1978	47	2,255 (57.5%)	-	219 (5.6%)	146 (3.7%)	2,620 (66.8%)	1,300 (33.2%)	3,920 (100%)
1979	38	1,268 (36.0%)	73 (2.1%)	234 (6.7%)	132 (3.7%)	1,707 (48.5%)	1,811 (51.5%)	3,518 (100%)
1981	20	1,045 (32.2%)	129 (4.0%)	78 (2.4%)	51 (1.6%)	1,303 (40.2%)	1,935 (59.8%)	3,238 (100%)
1982	30	1,733 (42.5%)	1,011 (24.8%)	168 (4.1%)	-	2,912 (71.4%)	1,164 (28.6%)	4,076 (100%)
1983	81	1,527 (42.2%)	185 (5.1%)	53 (1.5%)	54 (1.5%)	1,819 (50.3%)	1,797 (49.7%)	3,616 (100%)
Average Number of Fish		1,566	280	150	77	2,073	1,601	3,674
Average % of Total		42.1	7.2	4.1	2.1	55.5	44.6	100

<sup>1</sup> Includes only expandable random recoveries.

Table 5. Estimated harvest by gear type, escapement, and total return of coho salmon returning to the Berners River, 1974, 1978, 1979, 1982, and 1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Drift Gillnet	Sport	Total Catch	Escapement	Total Return
1974 <sup>2</sup>	244	7,863 (43.0%)	1,657 (9.1%)	4,625 (25.3%)	-	14,145 (77.4%)	4,124 (22.6%)	18,270 (100%)
1978	106	6,137 (44.8%)	-	4,347 (31.8%)	83 (0.6%)	10,567 (77.2%)	3,119 (22.8%)	13,686 (100%)
1979	58	2,708 (33.0%)	-	1,883 (23.0%)	137 (1.7%)	4,728 (57.7%)	3,460 (42.3%)	8,188 (100%)
1982	40	9,127 (34.7%)	-	9,679 (36.8%)	-	18,806 (71.5%)	7,505 (28.5%)	26,311 (100%)
1983	97	16,774 (51.2%)	-	5,819 (17.8%)	332 (1.0%)	22,925 (70.0%)	9,840 (30.0%)	32,765 (100%)
Average Number of Fish		8,522	331	5,271	110	14,234	5,610	19,844
Average % of Total		41.4	1.8	26.9	0.7	70.8	29.2	100

<sup>1</sup> Includes only expandable random recoveries.

<sup>2</sup> Data from Gray et al. (1978).



was also the highest recorded. The estimated overall harvest rate of 70.0% was near average. However, the troll fishery took a higher than usual percentage of the return (51.2%), while the estimated percentage taken by the drift gillnet fishery (17.8%) was the lowest recorded. Virtually all of the increase in the troll harvest rate of Berners River coho salmon over previous years occurred north of Cape Spencer, primarily in District 116 (Appendix Table 19). Troll fishing effort in waters between Cape Spencer and Cape Fairweather was greater in 1983 compared with most previous years. An average of 56 troll vessels reported landings from District 116 weekly from mid-July through the end of the troll season in 1983, compared with 44 in 1982 and 34 in 1981. As usual, the purse seine and sport fisheries took only a small percentage (less than 3%) of the Berners River run. The relatively small harvest by these fisheries was probably because of the late timing and fast migration rate of the Berners River stock.

The estimated total return of 8,987 adult coho salmon to Chilkoot Lake in 1983 was over twice as large as the estimated total return of 3,853 during the predominant parent year of 1979 (Table 6). The troll fishery harvested an estimated 43.3% of the 1983 return, while the purse seine and drift gillnet fisheries accounted for 6.4% and 30.2%, respectively. The majority of the troll harvest occurred north of Cape Spencer, primarily in District 116 (Appendix Table 20), as was the case for the Berners River stock. An estimated 707 fish, or 7.9%, of the total return was harvested in the Chilkoot River sport fishery (Mills 1984). The estimated overall harvest rate for the Chilkoot Lake stock in 1983 was 87.8% compared with an estimate of 80.5% for the 1979 return.

Based on expanded weir and fishery recoveries, the estimated overall harvest rate for the Chilkat Lake stock was 97.6% (Table 7). However, this estimate may be too high considering that the estimated percentage harvested by mixed stock troll and purse seine fisheries was 56.8% for the Chilkat Lake stock compared with 51.2% and 49.7%, respectively, for the Berners River and Chilkoot Lake stocks. Since all three of these stocks are characterized by very similar migration patterns and timing, it seems reasonable to expect that they would have quite similar harvest rates in the more distant mixed stock fisheries. It is possible that only a portion of the tagged return to Chilkat Lake was counted and sampled at the weir site. A significant portion of the escapement may have remained downstream when the weir was removed for the season on 13 November. A total of 2,500 coho salmon was counted during a survey of the lower Chilkat River on 6 December. Some of those fish were likely destined for Chilkat Lake. Another possible factor was different rearing and spawning tributaries. It's possible that fish rearing in Chilkat Lake hatched and returned to spawn elsewhere in the Tsirku River drainage. If that occurred, fish that were tagged in Chilkat Lake may not have returned to the weir site. Considering these possibilities, an adjustment was made to equalize the troll and purse seine harvest rate for Chilkat Lake with the average (50.4%) for the Berners River and Chilkoot Lake. This resulted in an adjusted overall harvest rate estimate of 86.6% for the Chilkat Lake stock with 36.2% of the run taken by the drift gillnet fishery (Table 7). The 1983 adjusted total adult coho salmon return estimate for Chilkat Lake was 49,244 compared with 3,364 in 1978 and 2,542 in 1979. This 15-20 fold increase over 1978 and 1979 is difficult to explain. It may have been related to possible straying of

Table 6. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Chilkoot Lake, 1979 and 1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Drift Gillnet	Inriver Sport	Total Catch	Escapement	Total Return
1979	15	1,292 (33.5%)	87 (2.3%)	1,466 (38.0%)	258 (6.7%)	3,103 (80.5%)	750 (19.5%)	3,853 (100%)
1983	66	3,898 (43.3%)	571 (6.4%)	2,711 (30.2%)	707 (7.9%)	7,887 (87.8%)	1,100 (12.2%)	8,987 (100%)
Average Number of Fish		2,595	329	2,087	482	5,495	925	6,420
Average % of Total		38.4	4.4	34.1	7.3	84.2	15.8	100

<sup>1</sup> Includes only expandable random recoveries.

Table 7. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Chilkat Lake, 1978, 1979, and 1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Drift Gillnet	Total Catch	Escapement	Total Return
1978	34	2,035 (60.5%)	-	891 (26.5%)	2,926 (87.0%)	438 (13.0%)	3,364 (100%)
1979	22	669 (26.3%)	-	907 (35.7%)	1,576 (62.0%)	966 (38.0%)	2,542 (100%)
1983	95	24,158 (55.3%)	661 (1.5%)	17,843 (40.8%)	42,662 (97.6%)	1,028 (2.4%)	43,690 (100%)
1983 <sup>2</sup> (adjusted)	95	24,158 (49.1%)	661 (1.3%)	17,843 (36.2%)	42,662 (86.6%)	6,582 (13.4%)	49,244 (100%)
Average Number of Fish <sup>3</sup>		8,954	220	6,547	15,721	2,662	24,789
Average % of Total <sup>3</sup>		45.3	0.4	32.8	78.5	21.5	100

<sup>1</sup> Includes only expandable random recoveries.

<sup>2</sup> Estimates adjusted under the assumption that the troll and purse seine harvest rate for Chilkat Lake was the same as the average estimate for the Berners River and Chilkoot Lake stocks (see text).

<sup>3</sup> Average includes only the adjusted estimates for 1983.

juveniles within the Chilkat River system in 1983 as well as improved survival and parent year escapement. The adjusted survival rate estimate for tagged fish in the 1983 return was 12.9% compared with 4.0% and 4.9%, respectively, for fish returning in 1978 and 1979.

The estimated 1983 coho salmon return to Ford Arm Lake totaled 5,986 adults compared with 4,363 in 1982 (Table 8). However, because of a greater harvest in 1983, the escapement totaled only 1,944 compared with 2,662 in 1982. The overall harvest rate estimate of 67.5% for 1983 was substantially higher than the estimate of 39.0% for 1982. This increase was attributed to greater catches by both the troll and purse seine fisheries which took an estimated 52.2% and 15.3%, respectively, of the total return in 1983, compared with 37.2% and 1.8%, respectively, in 1982. Tag recovery locations indicated that most of the troll harvest was taken in District 116 and northern District 113 (Appendix Table 8). Most purse seine recoveries were from Lisianski Inlet in District 113-95 and Slocum Arm in District 113-73 (Appendix Figure 1). The increased purse seine harvest in 1983 was primarily the result of increased effort to harvest a strong pink salmon return to the Ford Arm Lake outlet and other streams in northern District 113.

The estimated total 1983 return of 1,105 adults to Politofski Lake was less than half as large as the 1982 return of 2,598 (Table 9). Overall harvest rates during both years were relatively low, with estimates of 33.4% and 33.8%, respectively, for 1982 and 1983. All of the estimated catch during both years was taken by troll gear.

The estimated total return of 2,529 adults to Warm Chuck Lake in 1983 was close to the estimated 1982 return of 2,749 (Table 10). The overall harvest rate estimate for 1983 was lower at 51.0%, compared with 63.0% in 1982. The troll fishery harvested an estimated 27.2% of the total return in 1983 compared with 51.7% in 1982, while the purse seine fishery accounted for an estimated 23.8% and 11.3%, respectively, during 1983 and 1982. Because of small sample sizes during both years, the precision of these estimates is low.

The number of fishery recoveries of tagged Klakas Lake coho salmon was also low during both years (Table 11). The estimated 1983 total return and escapement were 3,741 and 1,328, respectively, compared with 2,686 and 627 in 1982. The overall harvest rate estimate decreased from 76.7% in 1982 to 64.5% in 1983. While the purse seine fishery accounted for most of the estimated catch in 1982 (53.7%), the troll fishery accounted for 49.1% compared with 15.4% for the purse seine fishery in 1983. Again, the precision of these estimates is low because of small sample sizes.

The 1983 total estimated return to Hugh Smith Lake (3,811) was substantially lower than the 1982 estimate of 6,025 (Table 12). The estimated total harvest rates during both years were similar at 64.4% in 1982 and 60.9% in 1983. Because of its location near southern inside waters, the harvest of returning Hugh Smith Lake coho salmon is spread widely over a number of fishing areas and gear types. The Alaska troll fishery took the majority of the harvest and accounted for 45.4% and 36.5%, respectively, of the total estimated return in 1982 and 1983. The second largest harvest was taken by the Alaska seine fishery which accounted for just over 9% of the total return during both years.

Table 8. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Ford Arm Lake, 1982-1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Total Catch	Escapement	Total Return
1982	31	1,622 (37.2%)	79 (1.8%)	1,701 (39.0%)	2,662 (61.0%)	4,363 (100%)
1983	73	3,127 (52.2%)	915 (15.3%)	4,042 (67.5%)	1,944 (32.5%)	5,986 (100%)
Average Number of Fish		2,374	497	2,871	2,303	5,174
Average % of Total		44.7	8.5	53.2	46.8	100

<sup>1</sup> Includes only expandable random recoveries.

Table 9. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Politofski Lake, 1982-1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Total Catch	Escapement	Total Return
1982	24	867 (33.4%)	-	867 (33.4%)	1,731 (66.6%)	2,598 (100%)
1983	10	373 (33.8%)	-	373 (33.8%)	732 (66.2%)	1,105 (100%)
Average Number of Fish		620	-	620	1,232	1,852
Average % of Total		33.6	-	33.6	66.4	100

<sup>1</sup> Includes only expandable random recoveries.

Table 10. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Warm Chuck Lake, 1982-1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Total Catch	Escapement	Total Return
1982	20	1,421 (51.7%)	311 (11.3%)	1,732 (63.0%)	1,017 (37.0%)	2,749 (100%)
1983	11	690 (27.2%)	601 (23.8%)	1,291 (51.0%)	1,238 (49.0%)	2,529 (100%)
Average Number of Fish		1,005	456	1,511	1,128	2,639
Average % of Total		39.4	17.6	57.0	43.0	100

<sup>1</sup> Includes only expandable random recoveries.

Table 11. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Klakas Lake, 1982-1983.

Year	Fishery Sample Size <sup>1</sup>	Troll	Purse Seine	Total Catch	Escapement	Total Return
1982	14	617 (23.0%)	1,442 (53.7%)	2,059 (76.7%)	627 (23.3%)	2,686 (100%)
1983	26	1,836 (49.1%)	577 (15.4%)	2,413 (64.5%)	1,328 (35.5%)	3,741 (100%)
Average Number of Fish		1,226	1,010	2,236	978	3,214
Average % of Total		36.0	34.6	70.6	29.4	100

<sup>1</sup> Includes only expandable random recoveries.



Table 12. Estimated harvest by gear type, escapement, and total return of coho salmon returning to Hugh Smith Lake, 1982-1983.

Year	Fishery Sample Size <sup>1</sup>	Alaska Troll	B.C. Troll	Alaska Seine	Alaska Gillnet	B.C. Net	Alaska Trap	Total Catch	Escapement	Total Return
1982	72	2,737 (45.4%)	272 (4.5%)	556 (9.2%)	232 (3.9%)	84 (1.4%)	-	3,881 (64.4%)	2,144 (35.6%)	6,025 (100%)
1983	183	1,390 (36.5%)	207 (5.4%)	359 (9.4%)	264 (6.9%)	53 (1.4%)	48 (1.3%)	2,321 (60.9%)	1,490 (39.1%)	3,811 (100%)
Average Number of Fish		2,064	239	458	248	68	24	3,101	1,817	4,918
Average % of Total		40.9	5.0	9.3	5.4	1.4	0.6	62.6	37.4	100

<sup>1</sup> Includes only expandable random recoveries.

Estimated percentages taken by the Alaska drift gillnet fishery, primarily in District 101, were 3.9% and 6.9%, respectively, in 1982 and 1983. Canadian fisheries harvested an estimated 5.9% of the total return in 1982 and 6.8% in 1983. Most of the Canadian catch was taken by troll gear. The Annette Island trap fishery harvested an estimated 1.3% of the total return in 1983.

The Kegan Lake weir was not operated throughout the coho salmon run. Therefore, it was not possible to estimate the total return. The distribution of fishery recoveries and the estimated harvest of tagged fish by area and gear type are shown in Table 13. Of the total catch, an estimated 67.9% was taken by troll gear, while 18.5% was taken by purse seine gear and 13.6% was taken by drift gillnet gear. The majority of the troll harvest occurred in the central outside area (Districts 113 and 154) while small percentages were taken in southern and central inside areas, southern intermediate areas, and other outside areas. The purse seine harvest occurred in southern inside and outside areas (Districts 101-104). Interestingly, the majority of the drift gillnet recoveries were taken in District 106 which indicated that a significant proportion of the return to Kegan Lake probably entered inside waters through Sumner and Upper Clarence Straits.

#### HARVEST RATES

In sequential "gauntlet" type fisheries such as occur for coho salmon in Southeastern Alaska, information on the area distribution of the harvest provides a biased indication of the relative fishing pressure exerted on stocks by different fisheries. For example, if equal numbers of returning fish from a single stock are harvested by two sequential fisheries, the harvest rate of the second fishery must be higher than that of the first since fewer fish are available to the second fishery. A reduction in fishing effort by the second fishery will effectively allow more fish to pass to the spawning grounds than a proportional effort reduction in the first fishery. In evaluating management options that affect conservation and allocation of stocks, an examination of harvest rate information provides a clearer picture of the probable results of various regulatory measures.

For this analysis, the term "harvest rate" refers to the proportion of the total number of fish that pass through a defined area that are harvested by fisheries in that area. The number of fish that pass through the area is the estimated total return minus fish previously harvested in other areas. Therefore, it is necessary to assume a direction of migration. In this analysis, it was assumed that returning coho salmon migrated by the most direct route(s) from the open ocean toward their systems of origin.

The total harvest rate for a stock was estimated as follows:

$$\text{Harvest Rate } (\hat{H}) = \frac{F}{F + E}$$

where F = estimated number of tagged fish harvested (expanded sum of random fishery recoveries).

Table 13. Estimated catch distribution of coded-wire tagged Kegan Lake coho salmon by area and gear type, 1983.

Area	Troll	Purse Seine	Drift Gillnet	Total
Northern Outside 116, 157, 181, 183, 186, 189	3.3 <sup>1</sup> (1) <sup>2</sup> 3.2% <sup>3</sup>	-	-	3.3(1) 3.2%
Central Outside 113, 154	45.6(10) 44.0%	-	-	45.6(10) 44.0%
Southern Outside 103, 104, 152	4.1(3) 4.0%	5.7(2) 5.5%	-	9.8(5) 9.5%
Southern Intermediate 105, 109, 110	3.5(2) 3.4%	-	-	3.5(2) 3.4%
Central Inside 106, 107, 108	4.0(2) 3.9%	-	12.8(6) 12.3%	16.8(8) 16.2%
Southern Inside 101, 102	9.7(5) 9.4%	13.5(5) 13.0%	1.4(1) 1.3%	24.6(11) 23.7%
Total	70.2(23) 67.9%	19.2(7) 18.5%	14.2(7) 13.6%	103.6(37) 100%

<sup>1</sup> Fishery recoveries expanded to total catch.

<sup>2</sup> Number of tags recovered from random fishery samples in parentheses.

<sup>3</sup> Percent of total.

E = estimated number of tagged fish in the escapement.

Estimated harvest rates by area (outside, intermediate, and inside waters) for adult coho salmon returning to ten study systems are shown in Appendix Tables 27-36.

### Outside Waters

In 1983, the highest average harvest rates in outside fisheries were experienced by the returns to three outer coastal systems: Ford Arm, Warm Chuck, and Klakas Lakes (Table 14). Estimated 1982-1983 average harvest rates in outer coastal and offshore waters for these stocks were 48.0%, 53.1%, and 56.3%, respectively. Returns to Politofski Lake, an outer coastal system on south Baranof Island, were subjected to less intensive fishing effort with estimated harvest rates in outside waters of 28.4% and 33.8%, respectively, for 1982 and 1983 (average 31.1%). Lower harvest rates for the Politofski Lake stock compared with other outside stocks may have resulted from a combination of factors. The migratory timing of the Politofski Lake stock appears to be somewhat early, with the midpoint of the migration in outside water occurring in late July. Therefore, that stock may be less available during August and September when the troll fishery targets primarily on coho salmon. The distribution of tag recoveries (Appendix Table 9, and Shaul et al. 1985) indicates that the Politofski Lake stock has a more restricted migration pattern through Southeastern Alaska fisheries when compared with most other stocks that have been studied. In 1982 and 1983, an estimated 77.8% and 100%, respectively, of the harvest of Politofski Lake coho salmon occurred in the central outside area (Districts 113 and 154). Nearly all subarea specific recoveries were from locations between Sitka Sound and Cape Ommaney. The majority of coho salmon returning to Politofski Lake may approach the coast more directly from offshore waters instead of following the coast southward through the intensive troll fishery north of Sitka. Because Politofski Lake's location is distant from major pink salmon producing systems, its coho salmon stock is less available to the purse seine fleet than the Ford Arm Lake stock.

In 1983, the Auke Lake coho salmon stock experienced the lowest harvest rate in outside waters (21.2%) compared with other tagged stocks. The harvest of Auke Lake coho salmon by outside fisheries has been consistently low averaging an estimated 9.4% during the 5 years for which data is available. The Auke Lake stock appears to exhibit a rather rapid migration through outside waters from Cross Sound northward, with a distinct peak in mid or late August. This may account for its relatively low availability to outside fisheries.

The harvest rate for the Speel Lake stock by outside fisheries was estimated at 28.3% in 1983 while estimates for 5 years averaged 20.6%. The three tagged Lynn Canal stocks (Berners, Chilkoot, and Chilkat Rivers) were subjected to outside harvest rates estimated at 35.6%, 39.7%, and 31.5%, respectively, in 1983. Most of the outside area harvest of Lynn Canal coho salmon occurred north of Cape Spencer (Appendix Tables 19-21).

For Hugh Smith Lake, the harvest rate in outside waters was estimated at 26.9% in 1983 compared with 31.9% in 1982.

Table 14. Estimated harvest rates <sup>1</sup> in outside waters <sup>2</sup> for coded-wire tagged wild Southeastern Alaska coho salmon, 1978-1983.

System	1978	1979	1980	1981	1982	1983	Average
Auke Lake	1.9%	-	8.5%	10.3%	5.3%	21.2%	9.4%
Speel Lake	10.0%	25.6%	-	9.9%	29.0%	28.3%	20.6%
Berners River	14.8%	27.4%	-	-	13.9%	35.6%	22.9%
Chilkoot Lake	-	29.7%	-	-	-	39.7%	34.7%
Chilkat Lake	5.9%	26.3%	-	-	-	31.5%	21.2%
Ford Arm Lake	-	-	-	-	31.9%	64.1%	48.0%
Politofski Lake	-	-	-	-	28.4%	33.8%	31.1%
Warm Chuck Lake	-	-	-	-	61.4%	44.9%	53.1%
Klakas Lake	-	-	-	-	57.5%	55.0%	56.3%
Hugh Smith Lake	-	-	-	-	31.9%	26.9%	29.4%
Average	8.2%	27.2%	8.5%	10.1%	32.4%	38.1%	32.7%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

The 1983 estimated outside harvest rates were the highest recorded for all of the northern Southeastern systems except Speel Lake, for which the 1982 estimate of 29.0% was only slightly higher than the 1983 estimate of 28.3%. For the five northern Southeastern systems with tag returns in both years, the average estimated harvest rate in outside waters was 36.6% in 1983 compared with 21.7% in 1982. Conversely, outside harvest rate estimates for the three systems in southern Southeastern (Warm Chuck, Klakas, and Hugh Smith Lakes) were lower in 1983 compared with 1982 (Tables 21-23). The average estimate for the three southern systems was 42.3% in 1983 compared with 50.3% in 1982.

#### Intermediate Waters

Harvest rates for Stephens Passage stocks in intermediate waters (Districts 105, 109, 110, 112, and 114) were reduced substantially in 1983 compared with 1982. Harvest rates in intermediate waters in 1983 were estimated at 11.2% for Auke Lake and 26.3% for Speel Lake compared with 1982 estimates of 37.4% and 54.0%, respectively (Table 15). Reduced purse seine effort in corridor areas in 1983 compared with 1982 was the primary factor contributing to this decrease. Harvest rate estimates for the Berners River stock in intermediate waters were virtually the same at 24.1% in 1982 and 24.2% in 1983. Because of its late timing, the Berners River stock is affected very little by the purse seine fishery in Districts 112 and 114.

With the exception of the large purse seine harvest in 1982, harvest rates in intermediate waters for index stocks in Stephens Passage and Lynn Canal have been reduced since 1978 while troll regulations have been more restrictive. The estimated average harvest rate in intermediate waters for Auke Lake, Speel Lake, Chilkat Lake, and the Berners River was 22.1% in 1983 compared with 41.0% in 1978.

Harvest rate estimates for outer coastal and southern stocks in intermediate waters have ranged from 0-7.3% in 1982 and 1983. Most of this harvest occurred in the outer portions of these areas (Cross Sound, Lower Chatham Strait, outer Sumner Strait) which indicated that few fish from these stocks actually migrated through corridor areas. An exception is that a portion of the return to Hugh Smith Lake appears to enter inside waters through Sumner Strait. This is evidenced by tag recoveries from Districts 106 and 108 (Appendix Table 12).

#### Inside Waters

Potential fishing pressure on Stephens Passage and Lynn Canal stocks by inside fisheries was reduced by the closure of northern Stephens Passage to trolling in 1979. Inside troll harvest rate estimates in 1978 were 17.6% for Auke Lake, 15.2% for Speel Lake, 2.9% for the Berners River, and 17.1% for Chilkat Lake (Appendix Tables 27-29 and 31). No inside area tag recoveries of fish harvested by troll gear were reported for these stocks during 1981-1983. The Juneau area sport fishery has consistently harvested only a small percentage of available fish. Sport harvest rate estimates have ranged from 1.3-9.2% (average 4.6%) for Auke Lake, 0-7.4% (average 3.7%) for Speel Lake, and 0-2.5% (average 1.4%) for the Berners River (Appendix Tables 27-29). No random recoveries of tagged Chilkoot Lake or Chilkat Lake coho salmon were made in the Juneau sport fishery.

Table 15. Estimated harvest rates<sup>1</sup> in intermediate waters<sup>2</sup> for coded-wire tagged wild Southeastern Alaska coho salmon, 1978-1983.

System	1978	1979	1980	1981	1982	1983	Average
Auke Lake	37.2%	-	3.3%	16.2%	37.4%	11.2%	21.1%
Speel Lake	44.3%	15.7%	-	29.3%	54.0%	26.3%	33.9%
Berners River	33.4%	7.8%	-	-	24.1%	24.2%	22.4%
Chilkoot Lake	-	8.6%	-	-	-	16.6%	12.6%
Chilkat Lake	49.3%	0.0%	-	-	-	26.8%	25.4%
Ford Arm Lake	-	-	-	-	6.3%	3.4%	4.8%
Politofski Lake	-	-	-	-	5.0%	0.0%	2.5%
Warm Chuck Lake	-	-	-	-	0.0%	3.9%	2.0%
Klakas Lake	-	-	-	-	4.9%	3.3%	4.1%
Hugh Smith Lake	-	-	-	-	7.3%	4.2%	5.8%
Average	41.0%	8.0%	3.3%	22.8%	17.4%	12.0%	13.5%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 105, 109, 110, 112, 114.

Drift gillnet harvest rates have varied greatly among stocks in Stephens Passage and Lynn Canal. The drift gillnet fisheries have taken an estimated 0.3-4.8% (average 2.8%) of available Auke Lake coho salmon (Appendix Table 27). Most of these fish were harvested along the eastern shoreline of lower Lynn Canal (District 115-10). Estimated drift gillnet harvest rates for the Speel Lake stock ranged from 2.9-14.4% (average 9.0%) (Appendix Table 28). As was discussed earlier, drift gillnet harvest rates for Taku River stocks have probably been substantially higher than for the Speel Lake stock because of the Taku River's closer proximity to an area of intensive fishing effort.

Drift gillnet harvest rates for the Lynn Canal stocks are probably the highest of any in the region. In some years, more than 300 drift gillnet vessels (approximately three-fourths of the Southeastern Alaska fleet) have been observed fishing in Lynn Canal during the fall fishing period. The fishery is managed primarily for the more abundant fall chum salmon and, therefore, there is often a substantial risk of overharvesting coho salmon stocks. Drift gillnet harvest rate estimates for the Berners River stock ranged from 35.2-58.2% (average 46.7%) in 1978, 1979, 1982, and 1983 (Appendix Table 29). The 1983 estimate of 37.2% was low despite intensive fishing effort north and south of Berners Bay. It appeared that the fish moved rapidly through the fishing area and were, therefore, less available to the fishery. The 1983 adjusted drift gillnet harvest rate for Chilkat Lake was 73.7% compared with previous estimates of 67.0% and 48.4%, respectively, for 1978 and 1979 (Appendix Table 31). The estimated drift gillnet harvest rate for the Chilkoot Lake stock in 1983 was 60.0% compared with an estimate of 59.3% in 1979 (Appendix Table 30).

A substantial portion of the coho salmon run into the Chilkoot River is harvested by the freshwater sport fishery. An estimated 39.1% of fish entering the river were harvested in 1983 compared with 25.6% in 1979.

Inside area harvest rate estimates ranged from 1.6-2.2% for Warm Chuck Lake, and 6.2-14.3% for Klakas Lake in 1982-1983 (Table 16). Tag recoveries indicated that the inside harvest of these stocks occurred primarily in the lower Clarence Strait - Dixon Entrance Area (Districts 101 and 102). There was no reported harvest of Ford Arm Lake and Politofski Lake coho salmon in inside areas in 1983. A single tagged Ford Arm Lake coho salmon was recovered from the troll fishery in District 106 in 1982 (Shaul et al. 1985).

The estimated harvest rate in inside waters for the Hugh Smith Lake stock was 37.1% in 1983 compared with 35.1% in 1982. The catch in inside waters was distributed among troll, purse seine, drift gillnet, and trap gear.

#### MIGRATORY TIMING

An understanding of the timing of the overall migration and of individual component stocks is a necessary basis for improving management of Southeastern Alaska coho salmon stocks. Weekly estimates of commercial catch and biweekly estimates of catch per unit of effort (CPUE) of tagged adult coho salmon from



Table 16. Estimated harvest rates<sup>1</sup> in inside waters<sup>2</sup> for coded-wire tagged wild Southeastern Alaska coho salmon, 1978-1983.

System	1978	1979	1980	1981	1982	1983	Average
Auke Lake	29.8%	-	5.0%	2.9%	6.1%	10.8%	10.9%
Speel Lake	33.8%	17.9%	-	6.2%	12.6%	5.6%	15.2%
Berners River	59.9%	36.9%	-	-	56.3%	38.5%	47.9%
Chilkoot Lake	-	59.3%	-	-	-	60.0%	59.6%
Chilkat Lake	72.7%	48.4%	-	-	-	73.7%	64.7%
Ford Arm Lake	-	-	-	-	0.8%	0.0%	0.4%
Politofski Lake	-	-	-	-	0.0%	0.0%	0.0%
Warm Chuck Lake	-	-	-	-	1.6%	2.2%	1.9%
Klakas Lake	-	-	-	-	14.3%	6.2%	10.2%
Hugh Smith Lake	-	-	-	-	35.1%	37.1%	36.1%
Average	49.0%	40.6%	5.0%	4.6%	15.8%	23.4%	24.7%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 101, 102, 106, 107, 108, 111, 115.

individual stocks in different areas in 1983 are shown as a proportion of the season's total by bar graphs (Appendix Figures 5-48). Time density distributions of total coho salmon catch and CPUE of all available stocks in the same areas are also shown.

Time strata used were 1 week or 2 week periods corresponding to the statistical weeks shown in Appendix Table 2. For CPUE determinations the estimated catch of tagged fish was multiplied by the proportion of the total commercial catch harvested by power troll gear for each area-time stratum. Effort was expressed in power troll units. The total number of landings per week was available from fish ticket data, while the average number of days fished per trip was available from interviews with skippers by the port sampling staff. CPUE (c/f) is the ratio of the estimated power troll harvest (c) of coded-wire tagged fish from a certain stock to the total number of landings made times the average number of days fished per trip by power troll vessels (f). No attempt was made to account for the effect of targeting on different species as was done by Funk (1981).

The resulting time density distributions were based on the date when fish were landed instead of when they were caught. Since the average trip length for troll vessels was approximately 4-6 days, the time when fish were caught preceded the time when they were landed by an average of 2-3 days. The lag time between catch and landing probably averaged less for purse seine and drift gillnet vessels than for troll vessels. For CPUE determinations, the first three days of week 39 were included in the same stratum with weeks 37-38, as the troll season ended on 20 September.

Of the three areas chosen for analysis of migratory timing, two overlap. The timing of all ten stocks with significant tag recoveries was compared for the outer coastal area from Dixon Entrance to Cape Suckling. The objective was to compare the timing of all stocks as they first became available to fisheries. Additional analysis was performed for stocks with an adequate number of tag recoveries from the area of most intensive mixed stock troll fishing effort in northern Southeastern. This area, including northern outside areas and District 114, is more appropriate for comparing the timing of northern stocks in the area where they are most intensively harvested by the troll fishery. Tag recovery sample sizes for northern stocks were larger for this area than for the outside coast including southern Southeastern because multiple area samples from near Cross Sound (Districts 113, 114, and 116) could be included. Finally, migratory timing in southern inside districts (101 and 102) was determined for two stocks near Ketchikan (Hugh Smith Lake and Kegan Lake).

#### Outside Waters

The estimated 1983 time density distributions of catch and CPUE for 11 coho salmon stocks in outside waters (Districts 103, 104, 113, 116, 152, 154, 157, 181, and 189) are shown in Appendix Figure 5-26. Similar figures for eight systems in 1982 are shown in Shaul et al. (1985). In 1983, the troll season for coho salmon began on 1 July. The peak catch period in outside waters (mid-July - early August) was followed by a 10-day troll closure (5-14 August). The midpoint (50% date) of the total season's catch in outside waters occurred on 27 July, while the central half occurred during 16 July-11 August. Avail-

ability of coho salmon to the outside troll fishery remained fairly stable at an average catch of approximately 30 fish per day for power troll vessels from mid-July until late August. The midpoint of abundance in outside waters occurred on approximately 9 August during the troll closure. The central half of the migration occurred during approximately 20 July-26 August.

The Speel Lake stock exhibited a typically broad, central timing pattern in outside waters (Appendix Figures 7 and 8). The midpoint and central half of the catch occurred during approximately 28 July and 13 July-25 August, respectively, while the midpoint and central half of the CPUE distribution occurred during approximately 28 August and 22 July-9 September.

The three tagged Lynn Canal stocks (Berners River, Chilkoot Lake, Chilkat Lake) exhibited a late timing pattern in outside fisheries with peaks and midpoints of catch and CPUE occurring in late August or September (Appendix Figures 9-14). The Auke Lake stock also exhibited late timing in 1983 and appeared to have peaked in late August or early September (Appendix Figures 5 and 6) compared with mid-August in 1982 (Shaul et al. 1985).

The Ford Arm Lake stock exhibited a broad, central timing pattern that was not significantly different than the timing of catch and abundance of the total mixture of available stocks in outside waters (Appendix Figures 15 and 16). The midpoint of catch occurred on approximately 1 August while the midpoint of cumulative CPUE occurred in mid-August. The central half of the run occurred during approximately 26 July-27 August.

Only 10 tagged Politofski Lake coho salmon were recovered from outside fisheries (Appendix Figures 17 and 18) however, their timing was again relatively early as it was in 1982 (Shaul et al. 1985) with midpoints of catch and cumulative CPUE in mid to late July.

The Warm Chuck and Klakas Lake stocks on the southern outside coast exhibited early to central timing in outside waters with midpoints of catch and abundance in late July (Appendix Figures 19-22). In 1982, the midpoints of catch and cumulative CPUE for both stocks occurred during the first week of August. Timing statistics may be slightly biased by the fact that these stocks are most available in the southern outside area where fishing effort peaks and decreases earlier than in the north.

The Hugh Smith Lake and Kegan Lake stocks from the southern inside area exhibited central migratory timing in outside waters (Appendix Figures 23-26). Both were available from early to mid-July through mid-September with midpoints of catch and CPUE occurring in early to mid-August (weeks 32-34).

Although the peaks and midpoints of migration in outside waters varied considerably among stocks, most were available throughout nearly the entire season from early or mid-July through mid-September. The data indicated that Politofski, Warm Chuck, and Klakas Lakes were exceptions in that availability of these stocks appeared to drop off in mid to late August. However, sample sizes for all three of these stocks were very small and, as previously mentioned, the apparent timing patterns of the Warm Chuck Lake and Klakas Lake stocks were likely affected by the early fishing pattern along the southern outside coast.

Based on the combined results of studies in 1982 and 1983, it appears that migration of the Politofski Lake stock may indeed be early, tapering off by the end of August.

#### Northern Outside Waters and Icy Strait

Appendix Figures 27-44 show the estimated time density distribution of catch and CPUE for selected stocks in northern outside waters and Icy Strait (Districts 113, 114, 116, 154, 157, 181, 183, 186, and 189). The overall catch and CPUE temporal distributions for all available stocks were slightly later than the previously discussed timing patterns in outside waters, including southern Southeastern and excluding Icy Strait (District 114).

The Speel Lake stock was available during early July (week 28) through the end of the troll season on 20 September (week 39), with midpoints of catch and cumulative CPUE occurring on approximately 1 August (week 32). The Auke Lake, Berners River, Chilkoot Lake, and Chilkat Lake stocks were available during the same period but had peaks and midpoints in late August and September (weeks 35-38) (Appendix Figures 27-36).

The Ford Arm Lake stock exhibited a central timing pattern and was available throughout the period (early July-20 September) (Appendix Figures 37 and 38). The midpoints of cumulative catch and CPUE occurred on approximately 30 July and 7 August, respectively. The Politofski Lake stock was available from the onset of the fishery until at least as late as the fourth week of August (week 35) (Appendix Figures 39 and 40) and appeared to have peaked in July. Tag recoveries from the Warm Chuck Lake and Klakas Lake stocks were insufficient for determining migratory timing in northern Southeastern.

The Hugh Smith Lake and Kegan Lake stocks were available in northern Southeastern throughout nearly the entire season, with peak abundance occurring in August (Appendix Figures 41 and 44). They exhibited somewhat central timing compared with the overall mixture of available stocks.

#### Southern Inside Waters

Appendix Figures 45 and 48 show coho salmon catch and CPUE time-density distributions for southern inside waters, principally Clarence Strait (Districts 101 and 102), compared with the estimated migratory timing of the Hugh Smith Lake and Kegan Lake stocks. The midpoints of cumulative overall catch and CPUE in the area occurred during approximately the first week of August (week 32). The central half of the catch occurred during approximately 21 July-25 August, while the central half of the run based on CPUE occurred during approximately 15 July-17 August.

The Hugh Smith Lake and Kegan Lake stocks are both representative of later stocks in Districts 101 and 102. The midpoints of cumulative catch and CPUE for those stocks occurred in mid to late August (weeks 34-36), while the central half of the runs occurred during mid-August through the first week of September (weeks 34-37).

All of the local wild and hatchery stocks in District 101 and 102 for which sufficient data is available appear to enter inside waters relatively late

in the season. This poses a question concerning the origin of relatively large catches taken early in the season before those stocks are highly available. Very limited data indicates that certain northern British Columbia coastal stocks migrate through Southeastern Alaska waters early in the season, principally in July (Shaul et al. 1983). However, the potential existence of important early local stocks in Districts 101 and 102 has not been fully investigated. Reflection Lake, which drains into Behm Canal is considered to have an early coho salmon run based on the timing of entry of fish into fresh water. Unfortunately, very few tagged fish from that stock have been recovered. Of a total of four recoveries in 1983 (Appendix Table 14) and three in 1984 from throughout Southeastern Alaska, six were harvested in July while only one was taken in August and none were recovered in September. No definite conclusions can be drawn from such a small sample, but these recoveries support the hypothesis that fish returning to Reflection Lake migrate through local marine waters early in the season.

In mid-July 1983, power trollers in lower Clarence Strait experienced average catch rates of over 50 coho salmon per day. Additional tagging studies are needed on southern Southeastern and northern British Columbia systems to better understand the origin and migration patterns of these fish.

#### JUVENILE COHO SALMON POPULATION ESTIMATES

Coded-wire tagging and recovery provides estimates of rearing or outmigrating populations at the time of tagging through use of the Peterson mark-recapture technique. A number of fish are tagged and adipose clipped (M) while a sample of returning adults (C) is examined and the number of marked fish (R) in that sample is determined. The population (N) at the time of marking is estimated by:

$$N = \frac{(M+1)(C+1)}{(R+1)}$$

Estimates of the number of predominantly age 1+ and older juvenile coho salmon rearing in ten systems during various years are shown in Table 17. The estimates may be slightly conservative since the portion of each population that outmigrated as age 1+ smolts may have been under-represented in the groups that were tagged. These younger fish may have suffered greater mortality, assuming that they outmigrated at a smaller size than age 2+ and older smolts. This bias would have been offset somewhat by any tagging mortality that occurred.

Rearing population estimates for Politofski Lake (52,605 and 47,415) were the lowest while those for the Berners River (241,806-968,398) were the highest. Higher juvenile abundance in the Berners River in 1980 and 1981 compared with previous years corresponded with higher adult returns in 1982 and 1983 (Table 5). Coho salmon production from the Speel Lake stock appeared to be somewhat consistent with juvenile population estimates ranging from 55,637 to 98,043 and adult return estimates ranging from 3,238-4,076 (Table 4).

Table 17. Estimated population size of predominantly age 1+ and older juvenile coho salmon for ten systems in Southeastern Alaska.

Location	Year	Dates	Estimated Rearing Population	95% C.I.
Speel Lake	1976	7/28-8/6	98,043	82,923-122,640
	1977	9/10-9/19	58,497	51,303-68,885
	1979	9/9-9/25	55,637	49,284-64,530
	1980	8/25-9/3	71,440	61,269-87,226
	1981	9/1-9/10	61,553	56,416-68,047
Berners River	1972	7/11-7/19	296,059	184,111-486,589
	1976	7/9-7/20	241,806	148,155-403,266
	1977	8/27-9/7	249,761	183,675-341,641
	1980	6/16-6/28	968,398	478,772-2,098,860
	1981	6/15-6/25	486,341	310,126-779,324
Chilkoot Lake	1976	8/31-9/16	88,661	55,134-145,715
	1977	8/13-8/20	135,338	87,229-214,188
	1981	8/10-8/20	152,896	123,636-209,164
Chilkat Lake	1976	9/1-9/13	80,124	30,757-245,009
	1977	8/20-8/24	48,337	26,284-91,995
	1981	7/28-8/7	334,940	150,117-826,848
Ford Arm Lake	1980	6/30-7/11	78,683	68,255-94,279
	1981	6/29-7/10	63,366	53,203-80,313
Politofski Lake	1980	7/14-7/26	52,605	38,349-72,412
	1981	7/13-7/23	47,415	39,722-60,334
Warm Chuck Lake	1980	8/25-9/5	49,132	41,319-62,090
	1981	6/29-8/31	81,538	59,279-112,880
Klakas Lake	1980	8/11-8/22	116,508	69,179-201,608
	1981	6/15-6/25	74,079	59,320-103,423
Hugh Smith Lake	1980	7/28-8/8	71,209	58,865-92,963
	1981	7/13-7/23	59,418	48,979-78,005
Kegan Lake	1981	7/27-8/6	163,500	105,392-258,786

The more than five-fold increase in the estimated rearing population in Chilkat Lake in 1981 compared with previous years is puzzling, especially in view of the previously discussed extremely high harvest rate estimate. Since it seems unlikely that the actual harvest rate was as high as the estimate (97.6%), another explanation seems in order for the large estimated juvenile population (334,940) and low adult escapement count (1,028). It is probable that either a large proportion of the escapement remained downstream from the weir when it was removed, or spawned in tributaries other than Chilkat Lake. There was an influx of glacial water from the Tsirku River into the most productive rearing habitat in lower Chilkat Lake during mid-summer 1981 (Shaul et al. 1983). Perhaps this event had an influence on the imprinting of juveniles and subsequent homing of returning adults causing a higher than normal proportion of fish tagged in Chilkat Lake to return to other spawning areas of the Tsirku River. Or perhaps the influx of river water caused an increased exchange of juveniles between Chilkat Lake and other parts of the system resulting in an estimate of the juvenile population that included not only Chilkat Lake but a much greater area.

Estimates of the smolt outmigration from Auke and Hugh Smith Lakes are shown in Table 18. Recent smolt counts at the Auke Creek weir are lower than estimates of the smolt outmigration from the system in the late 1970's. A decline in the sockeye salmon smolt outmigration has also been noted for this period which indicates an overall decrease in production of rearing salmon in the system.

The smolt outmigration from Hugh Smith Lake was estimated at 44,051 in 1981 and 29,282 in 1982 compared with rearing juvenile population estimates of 71,209 in 1980 and 59,418 in 1981. Therefore, survival rate estimates from July-August of the last year in freshwater until the spring smolt outmigration were 61.9% and 49.3%, respectively.

## SURVIVAL

Survival from the time of tagging (smolt or age 1+ juvenile) to the adult stage was estimated as follows:

$$\text{Survival Rate (S)} = \frac{F + E}{T}$$

Where: F = estimated number of marked fish harvested

E = number of marked fish in the escapement

T = number of smolts or juveniles tagged

Estimated survival rates for the ten study systems are shown in Table 19. Juvenile survival figures should be considered as minimum estimates because a small percentage of tagged juveniles usually outmigrate as smolts two years after being tagged instead of the spring following tagging.

Table 18. Estimated smolt outmigration from Auke and Hugh Smith Lakes.

Location	Year	Number of Smolts	95% C.I.
Auke Lake	1976	9,902	9,044-10,996
	1977	18,395	15,824-22,341
	1979	8,790	8,136-9,590
	1980	9,821	Total Count
	1981	7,140	Total Count
	1982	6,607	Total Count
	1983	6,634	Total Count
	1984	7,036	Total Count
Hugh Smith Lake	1981	44,051	35,861-59,324
	1982	29,282	26,262-33,350



Table 19. Estimated survival rates of predominantly age 1+ and older wild juvenile coho salmon and smolts from the time of tagging (1981-1982) until entry into the fisheries (1983) for ten systems in Southeastern Alaska.

Location	Number Marked	Dates	Estimated Marked Return	Survival Rate
Auke Lake	6,245 Smolts	8 May-15 June	1,008(1,343) <sup>1</sup>	16.1%(21.5%) <sup>1</sup>
Speel Lake	12,120 Juveniles	1-10 September	717	5.9%
Berners River	7,826 Juveniles	15-25 June	503	6.4%
Chilkoot Lake	5,359 Juveniles	10-20 August	330	6.2%
Chilkat Lake	2,603 Juveniles	28 July-7 August	298 335	11.4%(unadjusted) 12.9%(adjusted) <sup>2</sup>
Ford Arm Lake	6,926 Juveniles	29 June-10 July	629	9.1%
Politofski Lake	6,591 Juveniles	13-23 July	155	2.4%
Warm Chuck Lake	2,763 Juveniles	29 June-9 July	74	2.7%
Klakas Lake	3,009 Juveniles	15-25 June	148	4.9%
Hugh Smith Lake	3,735 Juveniles	13-23 July	181 <sup>3</sup> 189 215	4.8% <sup>3</sup> 5.1% 5.8%
	5,573 Smolts	28 April-15 June	559 <sup>3</sup> 585 593	10.0% 10.5% 10.6%

<sup>1</sup> The higher marked return and survival rate estimates for Auke Lake smolts (in parentheses) include the return of jacks (age .0) in 1982; the other estimates include only adult returns.

<sup>2</sup> The higher estimates of marked return and survival rate for Chilkat Lake juveniles include an upward adjustment of the number of marked fish in the escapement based on a comparison of troll and seine harvest rates with the Berners River and Chilkoot Lake (see section titled "Harvest by Gear Type").

<sup>3</sup> Range of estimates depending on whether tag loss was attributed entirely to the juvenile release group, the smolt release group, or was equal for both groups.

The estimated survival rate of 16.1% (excluding jacks) for Auke Lake smolts that outmigrated in 1982 was the highest recorded for that system. Previous estimates were 10.5%, 9.0%, 8.2%, and 11.8% for 1977, 1979, 1980, and 1981, respectively (Shaul et al. 1985).

The estimated survival rate of 5.9% for 1981 Speel Lake juveniles was also the highest recorded and was close to the estimate of 5.7% for 1980. The estimate of 6.4% for the Berners River was the highest recorded for that system and was substantially higher than the 2.5% survival rate estimate for the previous years. Juveniles tagged at Chilkoot Lake in 1981 survived at a rate of 6.2% compared with 2.9% juveniles tagged there in 1977. Chilkat Lake juveniles survived at 11.4% (12.9% according to the adjusted estimate) compared with estimates of 4.0% and 4.9% for fish tagged in 1976 and 1977, respectively.

Ford Arm Lake juveniles tagged in 1981 also experienced an excellent survival rate estimated at 9.1% compared with 5.5% in 1980. However, the survival rates of Politofski and Warm Chuck Lake juveniles were lower compared with 1980. Fish tagged at Politofski Lake in 1981 survived at an estimated 2.4% compared with 4.8% for fish tagged in 1980. Warm Chuck Lake juveniles tagged in 1981 survived at 2.7% compared with 5.5% for fish tagged in 1980. Juveniles tagged at Klakas Lake in 1981 exhibited a higher survival rate of 4.9% compared with 2.2% for fish tagged there in 1980.

Hugh Smith Lake juveniles tagged in 1981 experienced a lower survival rate compared with those tagged in 1980. Because of tag loss that could not be attributed specifically to the juvenile or smolt tagged groups, it was impossible to obtain a point estimate. Depending on tag loss, juveniles tagged in 1981 survived at 4.8-5.8% compared with 7.7-11.2% for those tagged in 1980. Smolt survival rate estimates were 10.0-10.6% for smolts tagged in 1982 compared with 6.1-13.3% for smolts tagged in 1983 at Hugh Smith Lake.

The average of estimated juvenile to adult survival rates for nine systems was 6.2% for fish tagged in 1981. This was higher than the average of 4.4% for juveniles tagged in seven systems in 1980 (Shaul et al. 1985). Survival rates were consistently the highest recorded for juveniles tagged in 1981 and smolts tagged in 1982 in the Lynn Canal and Stephens Passage areas. Survival rates in outer coastal and southern areas were less consistent from system to system.

## SUMMARY AND DISCUSSION

### Harvest Rates

Estimated total 1983 harvest rates for coho salmon returns to 10 study systems were as follows: Auke Lake, 37.5%; Speel Lake, 50.3%; Berners River, 70.0%; Chilkoot Lake, 87.8%; Chilkat Lake, 86.6%; Ford Arm Lake, 67.5%; Politofski Lake, 33.8%; Warm Chuck Lake, 51.0%; Klakas Lake, 64.5%; and Hugh Smith Lake, 60.9%. These compare with 1982 estimates ranging from 33.4-76.7% (ave. 59.4%) for eight systems. No tagged coho salmon returned to upper Lynn Canal systems in 1982.

### Stephens Passage Stocks:

Estimated 1983 harvest rates on the Auke Lake and Speel Lake stocks of 37.5% and 50.3%, respectively, were close to the average since 1978, and lower than 1982 estimates of 44.4% and 71.4%. While the troll harvest percentages remained virtually the same, the major factor in the decrease in harvest rates for these stocks was a substantially reduced purse seine harvest in 1983 compared with 1982. Troll fishery restrictions implemented after 1978 appear to have significantly reduced the proportion of the return to Stephens Passage systems than was harvested by troll gear. In 1982 and 1983, the troll fishery harvested an estimated 29% of the total return to Auke Lake and 42% of the return to Speel Lake compared with 1978 estimates of 49% and 58%, respectively, for those systems. While 1982 and 1983 estimated troll harvest percentages for the returns to Auke and Speel Lakes were substantially below the 1978 estimates, they have increased a few percent over 1979-1981 figures. During 5 years of study the estimated average harvest by gear type as a percentage of the total return to Auke Lake has been: 28.6% troll, 2.7% purse seine, 1.9% drift gillnet, and 3.1% sport. Similar figures for 5 years of study on the Speel Lake stock are: 41.2% troll, 7.2% purse seine, 4.1% drift gillnet, and 2.1% sport. Taku River stocks appear to have been harvested at a substantially higher rate by drift gillnet gear compared with the Speel Lake stock (Shaul et al. 1983).

### Lynn Canal Stocks:

Upper Lynn Canal stocks were likely the most heavily harvested coho salmon stocks in the region in 1983 with harvest rate estimates of 87.8% and 86.6%, respectively, for returns to Chilkoot Lake and Chilkat Lake. The estimate for Chilkat Lake was adjusted downward from 97.6% based on a comparison of troll and purse seine harvest rates with the Berners River and Chilkoot Lake stocks. The harvest rate estimate for Chilkat Lake did not account for in-river sport and subsistence catches. Although it was lower than estimates for upper Lynn Canal stocks, the estimated harvest rate of 70.0% for the return to the Berners River in lower Lynn Canal was higher than estimates for stocks in other parts of the region.

Troll harvest percentages for returns to the Berners River, Chilkoot Lake, and Chilkat Lake were estimated at 51.2%, 43.3%, and 49.1%, respectively. The most important troll harvest area was north of Cape Spencer (Districts 116, 157, 181, 183, 186, 189) where an estimated 28.1%, 25.4%, and 23.5%, respectively, of the returns to the three systems was harvested. Most of the remaining troll harvest occurred in Icy and upper Chatham Straits (Districts 112 and 114), and in northern Districts 113 and 154. The drift gillnet fishery accounted for an estimated 17.8%, 30.2%, and 36.2%, respectively, of returns to the Berners River, Chilkoot Lake, and Chilkat Lake.

Although its harvest percentage was smaller, the drift gillnet fishery had a substantially greater effect on escapements to upper Lynn Canal systems than did the troll fishery. Drift gillnet harvest rates for Chilkoot and Chilkat Lakes were estimated at 60.0% and 73.7%, respectively, of fish that had escaped the troll and purse seine fisheries. The estimated drift gillnet harvest rate (37.2%) for the Berners River stock was somewhat lower than the estimated troll harvest rate of 51.2%. Previous estimates of the drift gillnet harvest rate for

the Berners River ranged from 35.2%-58.2%. The 1979 estimate of 59.3% for Chilkoot Lake was very close to the 1983 estimate of 60.0%. Previous drift gillnet harvest rate estimates for Chilkat Lake were 67.0% in 1978 and 48.4% in 1979.

The freshwater sport fishery has a significant impact on escapement to spawning areas around Chilkoot Lake. This fishery harvested only an estimated 6.7% and 7.9%, respectively, of the total return in 1979 and 1983. However, this amounted to 25.6% and 39.1%, respectively, of the actual escapement to the river after removal by other fisheries.

Because of their late migratory timing through the fishing districts, the Lynn Canal stocks are not highly available to the purse seine and Juneau sport fisheries. Estimates derived from all past tagging studies indicated that the average percentage of the total return taken by purse seine gear was 1.8% for the Berners River, 4.4% for Chilkoot Lake, and 0.4% for Chilkat Lake. The Juneau sport fishery accounted for an estimated average of 0.7% of the return to the Berners River, while no marine sport recoveries were made of tagged fish returning to Chilkoot and Chilkat Lakes.

#### Central Outside Stocks:

Estimated 1983 harvest rates for Ford Arm Lake, on Chichagof Island, and Politofski Lake, on southern Baranof Island, were 67.5% and 33.8%, respectively. The figure for Ford Arm Lake was substantially higher than the 1982 estimate of 39.0%. Part of the difference was due to an increased catch by purse seine vessels which targeted on large pink salmon (*Oncorhynchus gorbuscha*) returns to District 113 in 1983. The purse seine fishery harvested an estimated 15.3% of the total coho salmon return to Ford Arm Lake in 1983 compared with 1.8% in 1982. The data indicated that the troll fishery also harvested a greater portion of the return in 1983, with an estimated troll harvest percentage of 52.2% compared with 37.2% in 1982. The increased troll catch occurred primarily in Districts 113 and 116.

Harvest rate estimates for Politofski Lake were virtually identical between years at 33.4% and 33.8%, respectively, in 1982 and 1983. The vast majority of the harvest occurred in the central outside area (Districts 113 and 154). All of the estimated catch of Politofski Lake coho salmon was taken by the troll fishery during both years.

#### Southern Outside Stocks:

Harvest rates for Warm Chuck and Klakas Lakes on the southern outside coast were estimated at 51.0% and 64.5%, respectively, in 1983. These estimates were lower than 1982 figures of 63.0% and 76.7%, respectively. Tag recovery sample sizes were low for both systems during both years, primarily because relatively few fish were tagged. Most of the catch occurred in the southern outside area (Districts 103, 104, 152) where one-third to half of total returning fish were harvested. Smaller percentages were taken in northern and central outside waters, lower Chatham Strait, and lower Clarence Strait. There were no reported Canadian recoveries of tagged fish returning to Warm Chuck and Klakas Lakes. This may have been due to a combination of low interception rates and

a low number of returning tagged fish. Canadian fisheries accounted for an estimated 12.6% of the total catch of coho salmon returning to the nearby Klawock hatchery in 1981 (Shaul et al. 1985).

The estimated percentage of returns to southern outside index systems that was taken by the troll fishery ranged from 23.0-51.7% (average 37.8%) in 1982 and 1983. The estimated percentage taken by the purse seine fishery ranged from 11.3-53.7% (average 26.0%).

#### Southern Inside Stocks:

The estimated 1983 harvest rate for the Hugh Smith Lake stock was 60.9% compared with a 1982 estimate of 64.4%. The harvest of tagged fish returning to Hugh Smith and Kegan Lakes was distributed widely over areas and gear types. An estimated 54.1% of the 1983 return to Hugh Smith Lake was harvested by Alaskan fisheries while 6.8% was taken by Canadian fisheries. These figures compare with 1982 estimates of 58.5% and 5.9%, respectively.

#### Migratory Timing

Information collected in 1983 on the migratory timing of various stocks generally supported previous findings (Shaul et al. 1985). The Speel, Ford Arm, Warm Chuck, Klakas, Hugh Smith, and Kegan Lake stocks exhibited central migratory timing in outside waters with midpoints from late July to late August. The Auke Lake stock appeared to peak in late August-early September, which was later than usual. However, the apparent timing of that stock may have been affected by the troll closure which occurred around its usual peak. The Politofski Lake stock appeared to have an earlier midpoint in mid to late July as it did in 1982. The Lynn Canal stocks (Berners River, Chilkoot Lake, Chilkat Lake) exhibited late timing in intermediate and outside fisheries with peaks and midpoints of catch and CPUE occurring in late August and September.

Both the Hugh Smith Lake and Kegan Lake stocks were representative of the later migrating stocks that were available in southern inside districts (101 and 102). Additional research is needed to determine the origin and characteristics of important early stocks that contribute to excellent coho salmon fishing in those districts in July.

#### Survival

Estimated survival rates to the returning adult stage (age .1) for predominantly age 1+ juvenile coho salmon tagged in Southeastern Alaska systems in 1981 averaged 6.2% (range 2.4-12.9%). Auke Lake and Hugh Smith Lake smolts tagged in 1982 survived at 16.1% and 10.0-10.6%, respectively. Survival rates were the highest recorded for Lynn Canal and Stephens Passage systems, but were less consistent in outer coastal and southern areas. Survival rate estimates for Hugh Smith Lake juveniles from July-August of the last year in freshwater until smolting the following spring were 61.9% in 1980-1981 and 49.3% in 1981-1982.

## RECOMMENDATIONS

The Southeastern Alaska Coho Salmon Research Project has been in existence since 1969 with emphasis since 1972 placed on tagging studies. With the accumulation of several years of data on a wide variety of stocks throughout the region, it seems appropriate at this point to examine two questions:

- (1) How can the information that has been gained by used to improve management of the fisheries?
- (2) What directions should the project take to maximize the utility of information obtained from future research?

Answers to question 1 are just beginning to emerge from the cumulative volume of data. In common with many other biological investigations, more questions than answers have resulted from research on Southeastern Alaska coho salmon stocks. Part of the problem has been insufficient information on a broad geographic scale. We may be able to determine an appropriate management strategy for controlling the harvest of stocks in one area, but how would that strategy affect contributing stocks from other geographical areas? There is justifiable concern that a small amount of information is little better or possibly worse than no information at all, depending on how representative it is and to what extent it is actively applied. For example, if it is known that a heavily harvested stock is highly available in a certain area and time period, there is a strong temptation to implement specific time-area restrictions that protect the stock from overharvest. However, the fleet will surely move to other areas where it can fish and, perhaps, increase pressure on other stocks that are actually in greater need of protection. For that reason, most restrictions to date that have addressed conservation and allocation concerns in mixed stock fisheries have been relatively broad in scope. An example is the region-wide 10-day troll closure near the peak of the season.

Since 1980, studies were expanded to provide information on the harvest rates, migration routes, and timing of index stocks in most major coho salmon producing areas of the region. Examining harvest rates and stock characteristics over the region as a whole has furthered the possibility of providing more educated specific management responses to conservation and allocation concerns. It will be some time before there is sufficient understanding to develop objective escapement goals for individual index stocks. However, we have begun to develop a clearer understanding of which stocks receive the highest harvest rates and where and when they are harvested. This information can be used to determine which stocks warrant most intensive inseason management and to develop specific regulations that will help insure adequate escapement with minimal disruption of region-wide fisheries.

Inseason management of Southeastern Alaska coho salmon stocks relies almost entirely on fishery performance indicators. There is a need for detailed evaluation of these indicators and their inter-relationships to determine those that are most useful at different times during the season. Fisheries for coho salmon extend over a relatively long period (more than 3 months). However, because of a long migration time (approximately 1 month) between out-

side and inside waters, there is a relatively narrow window of opportunity during which the strength of specific inside stock groups can be adequately assessed while significant options remain for adjusting harvest in the more mixed-stock fisheries. Managers need to develop an inseason plan that delineates "decision points" during the season when specific data sets are reviewed and appropriate management action taken. It will be necessary to develop an effective means of estimating hatchery contribution inseason so that management of the mixed stock fisheries will continue to be based on the strength of the natural stocks.

Combined harvest rates for index stocks by fisheries in outside and intermediate areas averaged 45-50% in 1982 and 1983 (range of estimates, 30.0-67.5%). These harvest rates alone are probably not excessive in years of average or better returns. They indicate that Southeastern Alaska coho salmon stocks are generally subjected to less ocean fishing pressure than Oregon stocks which, overall, experienced ocean harvest rates ranging from 59-78% (ave. 71%) in 1981-1983 (Oregon Department of Fish and Wildlife 1985). However, a management strategy needs to be developed to effectively reduce harvest rates by all fisheries when returns are weak. Primary concern should be directed toward stocks that are heavily impacted by inside fisheries. Particular attention should be given to careful management of the very intensively harvested Lynn Canal stocks. With consistent harvest rates of 80-90%, it is doubtful that all stocks in upper Lynn Canal can be maintained in a healthy condition, especially if environmental conditions become less favorable. At best, there will be incomplete utilization of available rearing habitat during some years. At worst, there will be extinctions of populations that utilize more marginal spawning habitat, and the productivity of the rearing habitat for coho salmon may be diminished by increases in competitive species. Fortunately, migratory characteristics specific to these stocks including a relatively late, rapid migration through northern waters can facilitate selective management for Lynn Canal coho salmon. Nevertheless, necessary restrictions to protect weak returns of these stocks may require that some of the allowable harvest of other stocks be forgone, both in the more mixed-stock fisheries and in the multispecies drift gillnet fishery.

There is a need for increased coho salmon stock assessment in order to determine long-term trends and gauge inseason variability in stock strength within and between geographical areas. Coded-wire tagging and escapement enumeration studies should be conducted annually on at least seven or eight index systems throughout Southeastern Alaska. In addition, increased escapement monitoring, including more frequent aerial and foot surveys, is needed on the heavily harvested major river systems (Chilkat, Taku, and Stikine). Additional short-term coded-wire tagging studies should be conducted as time and funding permit to determine migration routes, harvest rates, and timing of other important stock groups such as the Yakutat stocks and early-run stocks in southern Southeastern.

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## APPENDICES

Appendix Table 1. Pacific Marine Fisheries Commission (PMFC) area groupings of Southeastern Alaska regulatory districts.

	PMFC Area	Regulatory Districts
NOUT	Northern Outside	116, 157, 181, 183, 186, 189
COUT	Central Outside	113, 154
SOUT	Southern Outside	103, 104, 152
SIN	Southern Inside	101, 102, 150
SNTR	Southern Intermediate	105, 109, 110
CIN	Central Inside	106, 107, 108
STEP	Stephens Passage	111
CNTR	Central Intermediate	112, 114
LYNN	Lynn Canal	115

Appendix Table 2. Statistical weeks used in recording and compiling Southeastern Alaska commercial fisheries catch data.

STAT WEEK	YEAR/DATE 1978	YEAR/DATE 1979	YEAR/DATE 1980	YEAR/DATE 1981	YEAR/DATE 1982	YEAR/DATE 1983	YEAR/DATE 1984	YEAR/DATE 1985
1	0101 - 0107	0101 - 0106	0101 - 0105	0101 - 0103	0101 - 0102	0101 - 0101	0101 - 0107	0101 - 0105
2	0108 - 0114	0107 - 0113	0106 - 0112	0104 - 0110	0103 - 0109	0102 - 0108	0108 - 0114	0106 - 0112
3	0115 - 0121	0114 - 0120	0113 - 0119	0111 - 0117	0110 - 0116	0109 - 0115	0115 - 0121	0113 - 0119
4	0122 - 0128	0121 - 0127	0120 - 0126	0118 - 0124	0117 - 0123	0116 - 0122	0122 - 0128	0120 - 0126
5	0129 - 0204	0128 - 0203	0127 - 0202	0125 - 0131	0124 - 0130	0123 - 0129	0129 - 0204	0127 - 0202
6	0205 - 0211	0204 - 0210	0203 - 0209	0201 - 0207	0131 - 0206	0130 - 0205	0205 - 0211	0203 - 0209
7	0212 - 0218	0211 - 0217	0210 - 0216	0208 - 0214	0207 - 0213	0206 - 0212	0212 - 0218	0210 - 0216
8	0219 - 0225	0218 - 0224	0217 - 0223	0215 - 0221	0214 - 0220	0213 - 0219	0219 - 0225	0217 - 0223
9	0226 - 0304	0225 - 0303	0224 - 0301	0222 - 0228	0221 - 0227	0220 - 0226	0226 - 0303	0224 - 0302
10	0305 - 0311	0304 - 0310	0302 - 0308	0301 - 0307	0228 - 0306	0227 - 0305	0304 - 0310	0303 - 0309
11	0312 - 0318	0311 - 0317	0309 - 0315	0308 - 0314	0307 - 0313	0306 - 0312	0311 - 0317	0310 - 0316
12	0319 - 0325	0318 - 0324	0316 - 0322	0315 - 0321	0314 - 0320	0313 - 0319	0318 - 0324	0317 - 0323
13	0326 - 0401	0325 - 0331	0323 - 0329	0322 - 0328	0321 - 0327	0320 - 0326	0325 - 0331	0324 - 0330
14	0402 - 0408	0401 - 0407	0330 - 0405	0329 - 0404	0328 - 0403	0327 - 0402	0401 - 0407	0331 - 0406
15	0409 - 0415	0408 - 0414	0406 - 0412	0405 - 0411	0404 - 0410	0403 - 0409	0408 - 0414	0407 - 0413
16	0416 - 0422	0415 - 0421	0413 - 0419	0412 - 0418	0411 - 0417	0410 - 0416	0415 - 0421	0414 - 0420
17	0423 - 0429	0422 - 0428	0420 - 0426	0419 - 0425	0418 - 0424	0417 - 0423	0422 - 0428	0421 - 0427
18	0430 - 0506	0429 - 0505	0427 - 0503	0426 - 0502	0425 - 0501	0424 - 0430	0429 - 0505	0428 - 0504
19	0507 - 0513	0506 - 0512	0504 - 0510	0503 - 0509	0502 - 0508	0501 - 0507	0506 - 0512	0505 - 0511
20	0514 - 0520	0513 - 0519	0511 - 0517	0510 - 0516	0509 - 0515	0508 - 0514	0513 - 0519	0512 - 0518
21	0521 - 0527	0520 - 0526	0518 - 0524	0517 - 0523	0516 - 0522	0515 - 0521	0520 - 0526	0519 - 0525
22	0528 - 0603	0527 - 0602	0525 - 0531	0524 - 0530	0523 - 0529	0522 - 0528	0527 - 0602	0526 - 0601
23	0604 - 0610	0603 - 0609	0601 - 0607	0531 - 0606	0530 - 0605	0529 - 0604	0603 - 0609	0602 - 0608
24	0611 - 0617	0610 - 0616	0608 - 0614	0607 - 0613	0606 - 0612	0605 - 0611	0610 - 0616	0609 - 0615
25	0618 - 0624	0617 - 0623	0615 - 0621	0614 - 0620	0613 - 0619	0612 - 0618	0617 - 0623	0616 - 0622
26	0625 - 0701	0624 - 0630	0622 - 0628	0621 - 0627	0620 - 0626	0619 - 0625	0624 - 0630	0623 - 0629
27	0702 - 0708	0701 - 0707	0629 - 0705	0628 - 0704	0627 - 0703	0626 - 0702	0701 - 0707	0630 - 0706
28	0709 - 0715	0708 - 0714	0706 - 0712	0705 - 0711	0704 - 0710	0703 - 0709	0708 - 0714	0707 - 0713
29	0716 - 0722	0715 - 0721	0713 - 0719	0712 - 0718	0711 - 0717	0710 - 0716	0715 - 0721	0714 - 0720
30	0723 - 0729	0722 - 0728	0720 - 0726	0719 - 0725	0718 - 0724	0717 - 0723	0722 - 0728	0721 - 0727
31	0730 - 0805	0729 - 0804	0727 - 0802	0726 - 0801	0725 - 0731	0724 - 0730	0729 - 0804	0728 - 0803
32	0806 - 0812	0805 - 0811	0803 - 0809	0802 - 0808	0801 - 0807	0731 - 0806	0805 - 0811	0804 - 0810
33	0813 - 0819	0812 - 0818	0810 - 0816	0809 - 0815	0808 - 0814	0807 - 0813	0812 - 0818	0811 - 0817
34	0820 - 0826	0819 - 0825	0817 - 0823	0816 - 0822	0815 - 0821	0814 - 0820	0819 - 0825	0818 - 0824
35	0827 - 0902	0826 - 0901	0824 - 0830	0823 - 0829	0822 - 0828	0821 - 0827	0826 - 0901	0825 - 0831
36	0903 - 0909	0902 - 0908	0831 - 0906	0830 - 0905	0829 - 0904	0828 - 0903	0902 - 0908	0901 - 0907
37	0910 - 0916	0909 - 0915	0907 - 0913	0906 - 0912	0905 - 0911	0904 - 0910	0909 - 0915	0908 - 0914
38	0917 - 0923	0916 - 0922	0914 - 0920	0913 - 0919	0912 - 0918	0911 - 0917	0916 - 0922	0915 - 0921
39	0924 - 0930	0923 - 0929	0921 - 0927	0920 - 0926	0919 - 0925	0918 - 0924	0923 - 0929	0922 - 0928
40	1001 - 1007	0930 - 1006	0928 - 1004	0927 - 1003	0926 - 1002	0925 - 1001	0930 - 1006	0929 - 1005
41	1008 - 1014	1007 - 1013	1005 - 1011	1004 - 1010	1003 - 1009	1002 - 1008	1007 - 1013	1006 - 1012
42	1015 - 1021	1014 - 1020	1012 - 1018	1011 - 1017	1010 - 1016	1009 - 1015	1014 - 1020	1013 - 1019

Appendix Table 3. Recoveries of coded-wire tagged wild Auke Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
181	Troll	35	3-17-50	Random	3.5
116	Troll	30	3-17-50	Random	5.6
116	Troll	31	3-17-50	Random	4.8
116-12	Troll	31	3-17-50	Random	4.8
116-05	Troll	31	3-17-50	Random	4.8
116-05	Troll	31	3-17-50	Random	4.8
116-05	Troll	32	3-17-50	Random	3.9
116-05	Troll	32	3-17-50	Random	3.9
116-05	Troll	32	3-17-50	Random	3.9
116	Troll	34	3-17-50	Random	16.1
116	Troll	34	3-17-50	Random	16.1
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116-05	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	35	3-17-50	Random	3.5
116	Troll	36	3-17-50	Random	6.1
116	Troll	36	3-17-50	Random	6.1
116	Troll	36	3-17-50	Random	6.1
116	Troll	36	3-17-50	Random	6.1
116	Troll	36	3-17-50	Random	6.1
116	Troll	37	3-17-50	Random	3.0
116	Troll	38	3-17-50	Random	3.3
116	Troll	38	3-17-50	Random	3.3
116	Troll	38	3-17-50	Random	3.3
116	Troll	38	3-17-50	Random	3.3
116	Troll	38	3-17-50	Random	3.3
116	Troll	39	3-17-50	Random	2.2
116	Troll	39	3-17-50	Random	2.2
116	Troll	39	3-17-50	Random	2.2
116	Troll	39	3-17-50	Random	2.2
116	Troll	39	3-17-50	Random	2.2
NOUT	Troll	30	3-17-50	Random	5.6
113-91	Troll	30	3-17-50	Random	6.1
113-11	Troll	35	3-17-50	Random	3.4
113-S	Troll	35	3-17-50	Random	3.4
113-S	Troll	35	3-17-50	Random	3.4

-Continued-

Appendix Table 3. Recoveries of coded-wire tagged wild Auke Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
114-21	Troll	31	3-17-50	Random	6.5
114-21	Troll	31	3-17-50	Random	6.5
114-23	Troll	32	3-17-50	Random	3.5
114-21	Troll	35	3-17-50	Random	4.9
114-21	Troll	35	3-17-50	Random	4.9
114-21	Troll	35	3-17-50	Random	4.9
114-27	Troll	35	3-17-50	random	4.9
114-21	Troll	35	3-17-50	random	4.9
114-27	Troll	35	3-17-50	random	4.9
114-23	Troll	35	3-17-50	Random	4.9
114-23	Troll	35	3-17-50	Random	4.9
114-25	Troll	36	3-17-50	Random	4.6
114	Troll	36	3-17-50	Random	4.6
114-25	Troll	37	3-17-50	Random	3.9
112-14	Troll	35	3-17-50	Random	4.9
109-45	Troll	35	3-17-50	Random	0.8
109	Troll	36	3-17-50	Random	1.2
105	Troll	32	3-17-50	Random	2.1
110-21	Troll	32	3-17-50	Random	2.1
104-40	Seine	30	3-17-50	Random	3.6
114	Seine	38	3-17-50	Random	1.8
112-11	Seine	29	3-17-50	Random	1.4
112-16	Seine	35	3-17-50	Random	1.8
111-32	Gillnet	36	3-17-50	Random	1.9
111-32	Gillnet	36	3-17-50	Random	1.9
111	Gillnet	36	3-17-50	Random	1.9
115	Gillnet	36	3-17-50	Random	2.5
115	Gillnet	36	3-17-50	Random	2.5
115	Gillnet	36	3-17-50	Random	2.5
115	Gillnet	37	3-17-50	Random	1.3
115	Gillnet	38	3-17-50	Random	1.5
115	Gillnet	38	3-17-50	Random	1.5
115	Gillnet	38	3-17-50	Random	1.5
115	Gillnet	38	3-17-50	Random	1.5
115	Gillnet	41	3-17-50	Random	1.7
111-50	Sport	31	3-17-50	Random	5.1
111-50	Sport	32	3-17-50	Random	5.1
111	Sport	32	3-17-50	Random	5.1
111-50	Sport	33	3-17-50	Random	5.1
111-50	Sport	34	3-17-50	Random	5.1
111-50	Sport	36	3-17-50	Random	5.1
111	Sport	37	3-17-50	Random	5.1
111-50	Sport	37	3-17-50	Random	5.1
111-50	Sport	37	3-17-50	Random	5.1
111-50	Sport	38	3-17-50	Random	5.1
114-25	Troll	38	3-17-50	Select	-

-Continued-

Appendix Table 3. Recoveries of coded-wire tagged wild Auke Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
115	Gillnet	37	3-17-50	Select	-
111-50	Sport	36	3-17-50	Select	-
111-50	Sport	37	3-17-50	Select	-

<sup>1</sup> P - Landed in Pelican; S - landed in Sitka; NOUT - Districts 116, 157, 181, 183, 186, 189.



Appendix Table 4. Recoveries of coded-wire tagged wild Speel Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
183	Troll	29	4-21-45	Random	7.1
157	Troll	30	4-21-22	Random	5.6
116	Troll	28	4-21-45	Random	2.7
116-05	Troll	29	4-21-22	Random	7.1
116-05	Troll	31	4-21-22	Random	4.8
116-05	Troll	32	4-21-22	Random	3.9
116-05	Troll	32	4-21-45	Random	3.9
116	Troll	35	4-21-22	Random	3.5
116-05	Troll	35	4-21-22	Random	3.5
116	Troll	35	4-21-22	Random	3.5
116	Troll	35	4-19-10	Random	3.5
116	Troll	36	4-21-22	Random	6.1
116	Troll	36	4-21-22	Random	6.1
116	Troll	38	4-21-22	Random	3.3
116	Troll	38	4-21-22	Random	3.3
116	Troll	38	4-21-22	Random	3.3
116	Troll	39	4-21-22	Random	2.2
NOUT	Troll	35	4-21-22	Random	3.5
NOUT	Troll	35	4-21-45	Random	3.5
113-E	Troll	28	4-21-22	Random	5.7
113-E	Troll	28	4-21-22	Random	5.7
113-22	Troll	28	4-21-22	Random	5.7
113-P	Troll	28	4-21-22	Random	5.7
113-E	Troll	28	4-21-45	Random	5.7
113-P	Troll	29	4-21-22	Random	4.7
113-S	Troll	29	4-21-22	Random	4.7
113-P	Troll	29	4-21-45	Random	4.7
113-P	Troll	30	4-21-22	Random	6.1
113-P	Troll	30	4-21-45	Random	6.1
113-S	Troll	30	4-21-45	Random	6.1
113-22	Troll	31	4-21-22	Random	5.6
113-S	Troll	31	4-21-45	Random	5.6
113-S	Troll	32	4-21-22	Random	3.4
113-H	Troll	32	4-21-45	Random	3.4
113-21	Troll	32	4-21-45	Random	3.4
113-P	Troll	37	4-21-45	Random	25.6
114	Troll	32	4-21-22	Random	3.5
114-21	Troll	32	4-21-22	Random	3.5
114-21	Troll	32	4-21-22	Random	3.5
114-27	Troll	35	4-21-45	Random	4.9
114-27	Troll	35	4-21-45	Random	4.9
114-23	Troll	36	4-21-45	Random	4.6
114-23	Troll	38	4-21-45	Random	4.5
112	Troll	34	4-21-22	Random	6.2
112	Troll	34	4-21-22	Random	6.2

-Continued-

Appendix Table 4. Recoveries of coded-wire tagged wild Speel Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
112	Troll	34	4-19-10	Random	6.2
112-14	Troll	35	4-21-45	Random	4.9
112-40	Troll	35	4-21-45	Random	4.9
112	Troll	37	4-21-45	Random	3.9
109	Troll	30	4-21-22	Random	1.4
109	Troll	30	4-21-45	Random	1.4
109-45	Troll	31	4-21-22	Random	2.7
109	Troll	31	4-21-45	Random	2.7
109	Troll	32	4-21-22	Random	2.1
109-45	Troll	34	4-21-45	Random	3.3
109-45	Troll	34	4-21-45	Random	3.3
109-45	Troll	35	4-21-45	Random	0.8
109	Troll	36	4-21-45	Random	1.2
109-45	Troll	39	4-21-45	Random	0.2
110	Troll	32	4-21-22	Random	2.1
110-21	Troll	32	4-21-22	Random	2.1
110-21	Troll	32	4-21-45	Random	2.1
110-21	Troll	32	4-21-45	Random	2.1
110	Troll	32	4-21-45	Random	2.1
110	Troll	32	4-21-45	Random	2.1
110-31	Troll	34	4-21-45	Random	3.3
110-31	Troll	36	4-21-22	Random	1.2
110	Troll	36	4-21-45	Random	1.2
105, 109, 110	Troll	35	4-21-22	Random	0.8
113-95	Seine	32	4-21-45	Random	4.5
112	Seine	31	4-21-22	Random	4.2
112	Seine	34	4-21-22	Random	22.8
112-40	Seine	35	4-21-45	Random	1.8
106-30	Seine	34	4-21-45	Random	1.6
111	Gillnet	32	4-21-22	Random	1.6
111	Gillnet	33	4-21-22	Random	1.9
111-32	Gillnet	36	4-21-45	Random	1.9
115	Gillnet	38	4-21-45	Random	1.5
115-10	Gillnet	40	4-21-22	Random	3.0
111	Sport	33	4-21-22	Random	5.1
111	Sport	33	4-21-45	Random	5.1
111	Gillnet	29	4-21-45	Select	-
111	Sport	36	4-21-45	Select	-
111	Sport	36	4-21-45	Select	-

<sup>1</sup> P - Landed in Pelican; S - landed in Sitka, E - landed in Excursion Inlet; H - Landed in Hoonah; NOUT - Districts 116, 157, 181, 183, 186, 189.

Appendix Table 5. Recoveries of coded-wire tagged wild Berners River coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
183-10	Troll	34	4-19-21	Random	16.1
116	Troll	31	4-19-21	Random	4.8
116-05	Troll	31	4-19-21	Random	4.8
116-05	Troll	32	4-19-21	Random	3.9
116-05	Troll	32	4-19-21	Random	3.9
116-05	Troll	32	4-19-21	Random	3.9
116-05	Troll	32	4-19-21	Random	3.9
116	Troll	34	4-19-21	Random	16.1
116	Troll	34	4-19-21	Random	16.1
116	Troll	34	4-19-21	Random	16.1
116	Troll	35	4-19-21	Random	3.5
116	Troll	35	4-19-21	Random	3.5
116-05	Troll	35	4-19-21	Random	3.5
116-11	Troll	35	4-19-21	Random	3.5
116	Troll	35	4-19-21	Random	3.5
116	Troll	36	4-19-21	Random	6.1
116	Troll	36	4-19-21	Random	6.1
116-05	Troll	36	4-19-21	Random	6.1
116	Troll	37	4-19-21	Random	3.0
116	Troll	37	4-19-21	Random	3.0
116	Troll	38	4-19-21	Random	3.3
116	Troll	38	4-19-21	Random	3.3
NOUT	Troll	38	4-19-21	Random	3.3
154	Troll	28	4-19-21	Random	5.7
113-11	Troll	30	4-19-21	Random	6.1
113-71	Troll	30	4-19-21	Random	6.1
113-P	Troll	30	4-19-21	Random	6.1
113-S	Troll	32	4-19-21	Random	3.4
113-71	Troll	35	4-19-21	Random	3.4
113-E	Troll	35	4-19-21	Random	3.4
113-S	Troll	35	4-19-21	Random	3.4
114	Troll	30	4-19-21	Random	6.6
114	Troll	32	4-19-21	Random	3.5
114-21	Troll	35	4-19-21	Random	4.9
114-25	Troll	36	4-19-21	Random	4.6
114.25	Troll	36	4-19-21	Random	4.6
114-25	Troll	36	4-19-21	Random	4.6
114-23	Troll	37	4-19-21	Random	3.9
114	Troll	37	4-19-21	Random	3.9
114-25	Troll	38	4-19-21	Random	4.5
114-25	Troll	38	4-19-21	Random	4.5
114-25	Troll	38	4-19-21	Random	4.5
114-25	Troll	38	4-19-21	Random	4.5
114-25	Troll	38	4-19-21	Random	4.5
114-23	Troll	38	4-19-21	Random	4.5

-Continued-

Appendix Table 5. Recoveries of coded-wire tagged wild Berners River coho salmon from area-specific fishery samples, 1983 (continued).

[illegible]

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Appendix Table 5. Recoveries of coded-wire tagged wild Berners River coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
115	Gillnet	39	4-19-21	Random	2.4
115	Gillnet	39	4-19-21	Random	2.4
115	Gillnet	39	4-19-21	Random	2.4
115	Gillnet	39	4-19-21	Random	2.4
115	Gillnet	40	4-19-21	Random	3.0
115	Gillnet	40	4-19-21	Random	3.0
115	Gillnet	41	4-19-21	Random	1.7
111	Sport	33	4-19-21	Random	5.1
113-S	Troll	39	4-19-21	Select	-
115	Gillnet	38	4-19-21	Select	-

<sup>1</sup> P - landed in Pelican; S - landed in Sitka; E - landed in Excursion Inlet; NOUT - Districts 116, 157, 181, 186, 189.

Appendix Table 6. Recoveries of coded-wire tagged wild Chilkoot Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
157	Troll	30	4-21-26	Random	5.6
116	Troll	31	4-21-26	Random	4.8
116-05	Troll	31	4-21-26	Random	4.8
116-05	Troll	32	4-21-26	Random	3.9
116	Troll	35	4-21-26	Random	3.5
116	Troll	35	4-21-26	Random	3.5
116	Troll	36	4-21-26	Random	6.1
116	Troll	37	4-21-26	Random	3.0
116	Troll	37	4-21-26	Random	3.0
116	Troll	37	4-21-26	Random	3.0
116	Troll	37	4-21-26	Random	3.0
116	Troll	38	4-21-26	Random	3.3
116	Troll	38	4-21-26	Random	3.3
116	Troll	38	4-21-26	Random	3.3
116	Troll	38	4-21-26	Random	3.3
116	Troll	38	4-21-26	Random	3.3
116	Troll	39	4-21-26	Random	2.2
116	Troll	39	4-21-26	Random	2.2
116	Troll	39	4-21-26	Random	2.2
113-H	Troll	29	4-21-26	Random	4.7
113-91	Troll	31	4-21-26	Random	5.6
113-S	Troll	35	4-21-26	Random	3.4
113-S	Troll	35	4-21-26	Random	3.4
113-71	Troll	38	4-21-26	Random	5.7
114-23	Troll	37	4-21-26	Random	3.9
114-23	Troll	37	4-21-26	Random	3.9
114-23	Troll	37	4-21-26	Random	3.9
114	Troll	37	4-21-26	Random	3.9
114-25	Troll	38	4-21-26	Random	4.5
114	Troll	38	4-21-26	Random	4.5
104-50	Seine	32	4-21-26	Random	15.0
114	Seine	38	4-21-26	Random	1.8
111	Gillnet	39	4-21-26	Random	7.8
115	Gillnet	36	4-21-26	Random	2.5
115	Gillnet	37	4-21-26	Random	1.3
115	Gillnet	37	4-21-26	Random	1.3
115	Gillnet	37	4-21-26	Random	1.3
115	Gillnet	38	4-21-26	Random	1.5
115	Gillnet	38	4-21-26	Random	1.5
115	Gillnet	38	4-21-26	Random	1.5
115	Gillnet	38	4-21-26	Random	1.5
115	Gillnet	39	4-21-26	Random	2.4
115	Gillnet	39	4-21-26	Random	2.4
115	Gillnet	39	4-21-26	Random	2.4
115	Gillnet	39	4-21-26	Random	2.4

-Continued-

Appendix Table 6. Recoveries of coded-wire tagged wild Chilkoot Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115-10	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	40	4-21-26	Random	3.0
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	41	4-21-26	Random	1.7
115	Gillnet	40	4-21-26	Select	-

<sup>1</sup> S - landed in Sitka; H - landed in Hoonah.

Appendix Table 7. Recoveries of coded-wire tagged wild Chilkat Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
116	Troll	31	4-21-24	Random	4.8
116	Troll	31	4-21-24	Random	4.8
116-05	Troll	32	4-21-24	Random	3.9
116-05	Troll	32	4-21-24	Random	3.9
116-05	Troll	32	4-21-24	Random	3.9
116	Troll	34	4-21-24	Random	16.1
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	35	4-21-24	Random	3.5
116	Troll	36	4-21-24	Random	6.1
116	Troll	37	4-21-24	Random	3.0
116	Troll	38	4-21-24	Random	3.3
116	Troll	39	4-21-24	Random	2.2
116	Troll	39	4-21-24	Random	2.2
113-E	Troll	28	4-21-24	Random	5.7
113-E	Troll	28	4-21-24	Random	5.7
113-22	Troll	32	4-21-24	Random	3.4
113-S	Troll	35	4-21-24	Random	3.4
113-P	Troll	36	4-21-24	Random	4.4
114-21	Troll	30	4-21-24	Random	6.6
114-34	Troll	34	4-21-24	Random	6.2
114-27	Troll	35	4-21-24	Random	4.9
114-25	Troll	35	4-21-24	Random	4.9
114-23	Troll	35	4-21-24	Random	4.9
114-25	Troll	36	4-21-24	Random	4.6
114-21	Troll	36	4-21-24	Random	4.6
114	Troll	37	4-21-24	Random	3.9
114-23	Troll	37	4-21-24	Random	3.9
114	Troll	37	4-21-24	Random	3.9
114-25	Troll	38	4-21-24	Random	4.5
114	Troll	38	4-21-24	Random	4.5
109-45	Troll	30	4-21-24	Random	1.4
109	Troll	32	4-21-24	Random	2.1
102-80	Troll	38	4-21-24	Random	2.3
113-97	Seine	32	4-21-24	Random	4.5
115	Gillnet	35	4-21-24	Random	4.3
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5

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Appendix Table 7. Recoveries of coded-wire tagged wild Chilkat Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	36	4-21-24	Random	2.5
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	37	4-21-24	Random	1.3
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115-32	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	38	4-21-24	Random	1.5
115	Gillnet	39	4-21-24	Random	2.4
115	Gillnet	39	4-21-24	Random	2.4
115	Gillnet	39	4-21-24	Random	2.4
115	Gillnet	39	4-21-24	Random	2.4
115	Gillnet	39	4-21-24	Random	2.4
115-31	Gillnet	39	4-21-24	Random	2.4
115-31	Gillnet	39	4-21-24	Random	2.4
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	40	4-21-24	Random	3.0

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Appendix Table 7. Recoveries of coded-wire tagged wild Chilkat Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
115	Gillnet	40	4-21-24	Random	3.0
115	Gillnet	41	4-21-24	Random	1.7
115	Gillnet	41	4-21-24	Random	1.7
115	Gillnet	41	4-21-24	Random	1.7

<sup>1</sup> P - landed in Pelican; S - landed in Sitka; E - landed in Excursion Inlet.

Appendix Table 8. Recoveries of coded-wire tagged wild Ford Arm Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
183-10	Troll	34	4-21-23	Random	16.1
116	Troll	29	4-21-33	Random	7.1
116-05	Troll	31	4-21-23	Random	4.8
116-05	Troll	31	4-21-23	Random	4.8
116-05	Troll	31	4-21-33	Random	4.8
116-05	Troll	32	4-21-23	Random	3.9
116	Troll	32	4-21-23	Random	3.9
116	Troll	34	4-21-23	Random	16.1
116	Troll	35	4-21-23	Random	3.5
116-05	Troll	35	4-21-23	Random	3.5
116	Troll	35	4-21-23	Random	3.5
116	Troll	35	4-21-23	Random	3.5
116-05	Troll	35	4-21-33	Random	3.5
116	Troll	36	4-21-23	Random	6.1
116	Troll	38	4-21-23	Random	3.3
NOUT	Troll	35	4-21-23	Random	3.5
NOUT	Troll	35	4-21-23	Random	3.5
113-E	Troll	28	4-21-23	Random	5.7
113-E	Troll	28	4-21-23	Random	5.7
113-E	Troll	28	4-21-23	Random	5.7
113-P	Troll	28	4-21-23	Random	5.7
113-P	Troll	28	4-21-23	Random	5.7
113-P	Troll	28	4-21-33	Random	5.7
113-E	Troll	28	4-21-33	Random	5.7
113-P	Troll	28	4-21-33	Random	5.7
113-P	Troll	29	4-21-23	Random	4.7
113-P	Troll	29	4-21-23	Random	4.7
113-91	Troll	29	4-21-23	Random	4.7
113-E	Troll	29	4-21-23	Random	4.7
113-H	Troll	29	4-21-23	Random	4.7
113-H	Troll	29	4-21-23	Random	4.7
113-P	Troll	29	4-21-33	Random	4.7
113-45	Troll	29	4-20-21	Random	4.7
113-22	Troll	30	4-21-23	Random	6.1
113-S	Troll	30	4-21-23	Random	6.1
113-S	Troll	30	4-21-23	Random	6.1
113-P	Troll	30	4-21-23	Random	6.1
113-S	Troll	30	4-21-23	Random	6.1
113-P	Troll	30	4-21-33	Random	6.1
113-P	Troll	31	4-21-23	Random	5.6
113-P	Troll	31	4-21-23	Random	5.6
113-P	Troll	31	4-21-33	Random	5.6
113-P	Troll	32	4-21-23	Random	3.4
113-P	Troll	32	4-21-23	Random	3.4
113-S	Troll	32	4-21-23	Random	3.4

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Appendix Table 8. Recoveries of coded-wire tagged wild Ford Arm Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
113-31	Troll	32	4-21-33	Random	3.4
113-71	Troll	32	4-20-24	Random	3.4
113-S	Troll	33	4-21-23	Random	1.7
113-S	Troll	33	4-21-33	Random	1.7
113-81	Troll	35	4-21-23	Random	3.4
113-81	Troll	35	4-21-23	Random	3.4
113-71	Troll	35	4-21-23	Random	3.4
113-71	Troll	35	4-20-24	Random	3.4
113-P	Troll	36	4-21-23	Random	4.4
113-P	Troll	36	4-21-23	Random	4.4
113-S	Troll	36	4-21-23	Random	4.4
113-81	Troll	36	4-21-23	Random	4.4
113-P	Troll	38	4-21-33	Random	5.7
104-40	Troll	34	4-21-23	Random	3.4
114-21	Troll	30	4-21-23	Random	6.6
114-21	Troll	31	4-21-23	Random	6.5
114-21	Troll	31	4-21-23	Random	6.5
105, 109, 110	Troll	30	4-21-23	Random	1.4
113-P	Seine	31	4-21-23	Random	7.2
113-P	Seine	31	4-21-23	Random	7.2
113-95	Seine	32	4-21-23	Random	4.5
113-95	Seine	32	4-21-23	Random	4.5
113-95	Seine	32	4-21-23	Random	4.5
113-95	Seine	32	4-21-33	Random	4.5
113-61	Seine	32	4-21-33	Random	4.5
113-73	Seine	33	4-21-23	Random	18.3
113-73	Seine	33	4-21-23	Random	18.3
113-73	Seine	33	4-21-33	Random	18.3

<sup>1</sup> P - Landed in Pelican; S - Landed in Sitka; E - Landed in Excursion Inlet; H - Landed in Hoonah; NOUT - Districts 116, 157, 181, 183, 186, 189.

Appendix Table 9. Recoveries of coded-wire tagged wild Politofski Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
154	Troll	28	4-21-25	Random	5.7
113-31	Troll	28	4-20-26	Random	5.7
113-41	Troll	28	4-21-25	Random	5.7
113-S	Troll	28	4-21-25	Random	5.7
113-22	Troll	30	4-21-25	Random	6.1
113-22	Troll	30	4-21-25	Random	6.1
113-S	Troll	30	4-21-25	Random	6.1
113-S	Troll	30	4-21-25	Random	6.1
113-22	Troll	32	4-21-25	Random	3.4
113-22	Troll	35	4-21-25	Random	3.4

<sup>1</sup> S - Landed in Sitka.

Appendix Table 10. Recoveries of coded-wire tagged wild Warm Chuck Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
113-P	Troll	30	4-21-41	Random	6.1
104-40	Troll	30	4-21-41	Random	4.2
104-30	Troll	31	4-21-41	Random	2.2
103, 104, 152	Troll	30	4-20-17	Random	4.2
109-10	Troll	29	4-20-25	Random	1.4
105	Troll	29	4-20-17	Random	1.4
104	Seine	28	4-21-41	Random	4.2
104-40	Seine	29	4-21-41	Random	3.0
104-40	Seine	33	4-21-41	Random	4.8
103-90	Seine	34	4-20-25	Random	3.4
101	Seine	30	4-21-41	Random	1.6
103, 104, 152	Unknown	29	4-21-41	Random	-

<sup>1</sup> P - Landed in Pelican.

Appendix Table 11. Recoveries of coded-wire tagged wild Klakas Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
113-11	Troll	30	4-20-19	Random	6.1
113-S	Troll	30	4-20-19	Random	6.1
113-P	Troll	31	4-20-19	Random	5.6
104-40	Troll	31	4-20-19	Random	2.2
104-20	Troll	32	4-20-19	Random	1.1
104	Troll	32	4-20-19	Random	1.1
104-10	Troll	32	4-20-19	Random	1.1
103	Troll	28	4-20-19	Random	3.9
103	Troll	29	4-20-19	Random	1.9
103	Troll	29	4-20-19	Random	1.9
103-70	Troll	30	4-20-19	Random	4.2
103-11	Troll	32	4-20-19	Random	1.1
103-11	Troll	34	4-20-19	Random	3.4
103, 104, 152	Troll	29	4-20-19	Random	1.9
103, 104, 152	Troll	30	4-20-19	Random	4.2
109	Troll	28	4-20-19	Random	3.0
105-50	Troll	35	4-20-19	Random	0.8
102-10	Troll	28	4-20-19	Random	2.4
102-10	Troll	31	4-20-19	Random	1.9
101	Troll	32	4-20-19	Random	1.4
101	Troll	32	4-20-19	Random	1.4
104-40	Seine	28	4-20-19	Random	4.2
104	Seine	28	4-20-19	Random	4.2
104-40	Seine	29	4-20-19	Random	3.0
104-40	Seine	29	4-20-19	Random	3.0
104-20	Seine	34	4-20-19	Random	3.4

<sup>1</sup> S - landed in Sitka; P - landed in Pelican.

Appendix Table 12. Recoveries of coded-wire tagged wild Hugh Smith Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
157	Troll	30	4-21-30	Random	5.6
116	Troll	29	4-21-30	Random	7.1
116-05	Troll	32	4-21-30	Random	3.9
116-05	Troll	32	4-21-30	Random	3.9
116	Troll	34	4-21-30	Random	16.1
116	Troll	35	4-21-30	Random	3.5
116	Troll	35	4-21-30	Random	3.5
116	Troll	36	4-20-20	Random	6.1
116	Troll	37	4-20-16	Random	3.0
116	Troll	38	4-21-30	Random	3.3
113-E	Troll	28	4-21-30	Random	5.7
113-41	Troll	28	4-21-43	Random	5.7
113-P	Troll	29	4-21-30	Random	4.7
113-H	Troll	29	4-21-30	Random	4.7
113-71	Troll	29	4-21-30	Random	4.7
113-S	Troll	30	4-20-20	Random	6.1
113-S	Troll	30	4-20-20	Random	6.1
113-S	Troll	31	4-20-20	Random	5.6
113-P	Troll	31	4-21-30	Random	5.6
113-22	Troll	31	4-21-30	Random	5.6
113-P	Troll	31	4-21-30	Random	5.6
113-91	Troll	32	4-21-30	Random	3.4
113-91	Troll	32	4-21-30	Random	3.4
113-S	Troll	32	4-21-30	Random	3.4
113-H	Troll	32	4-21-43	Random	3.4
113-S	Troll	32	4-20-20	Random	3.4
113-S	Troll	33	4-20-20	Random	1.7
113-S	Troll	33	4-21-30	Random	1.7
113-P	Troll	34	4-21-30	Random	10.1
113-P	Troll	34	4-21-30	Random	10.1
113-P	Troll	34	4-21-43	Random	10.1
113-11	Troll	35	4-21-30	Random	3.4
113-22	Troll	35	4-20-20	Random	3.4
113-S	Troll	38	4-21-30	Random	5.7
104-40	Troll	28	4-21-30	Random	3.9
104-40	Troll	30	4-21-30	Random	4.2
104-10	Troll	31	4-21-30	Random	2.2
104	Troll	32	4-20-20	Random	1.1
104	Troll	32	4-21-30	Random	1.1
104-40	Troll	34	4-21-30	Random	3.4
104-40	Troll	34	4-21-30	Random	3.4
104-40	Troll	36	4-21-30	Random	6.8
103	Troll	29	4-21-30	Random	1.9
103-11	Troll	30	4-20-18	Random	4.2
103	Troll	31	4-21-30	Random	2.2

-Continued-



Appendix Table 12. Recoveries of coded-wire tagged wild Hugh Smith Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
103	Troll	31	4-21-43	Random	2.2
103-11	Troll	31	4-20-20	Random	2.2
103	Troll	34	4-20-20	Random	3.4
103, 104, 152	Troll	29	4-21-43	Random	1.9
103, 104, 152	Troll	32	4-21-30	Random	1.1
103, 104, 152	Troll	32	4-21-30	Random	1.1
103, 104, 152	Troll	32	4-20-20	Random	1.1
103, 104, 152	Troll	32	4-20-20	Random	1.1
103, 104, 152	Troll	34	4-21-30	Random	3.4
114-21	Troll	30	4-21-30	Random	6.6
114	Troll	34	4-21-30	Random	6.2
109	Troll	29	4-21-30	Random	1.4
109-10	Troll	29	4-21-30	Random	1.4
109	Troll	30	4-21-30	Random	1.4
109-10	Troll	30	4-21-30	Random	1.4
109	Troll	30	4-21-30	Random	1.4
109-10	Troll	30	4-21-30	Random	1.4
109-10	Troll	30	4-21-30	Random	1.4
109	Troll	30	4-20-20	Random	1.4
109	Troll	32	4-20-20	Random	2.1
109	Troll	32	4-21-30	Random	2.1
109-10	Troll	37	4-21-30	Random	4.5
105	Troll	35	4-21-30	Random	0.8
105-10	Troll	35	4-21-30	Random	0.8
105	Troll	38	4-21-30	Random	3.9
106-30	Troll	30	4-20-20	Random	2.0
106-41	Troll	35	4-21-30	Random	3.6
106-41	Troll	38	4-21-30	Random	1.5
106-41	Troll	38	4-21-43	Random	1.5
102-10	Troll	29	4-21-43	Random	2.2
102-10	Troll	31	4-21-43	Random	1.9
102-80	Troll	32	4-21-30	Random	1.4
102-80	Troll	37	4-21-30	Random	2.1
101-21	Troll	31	4-21-30	Random	1.9
101	Troll	32	4-21-30	Random	1.4
101	Troll	32	4-21-30	Random	1.4
101-21	Troll	32	4-20-20	Random	1.4
101-25	Troll	34	4-20-20	Random	5.9
101	Troll	34	4-21-30	Random	5.9
101	Troll	35	4-21-30	Random	1.9
101	Troll	35	4-21-43	Random	1.9
101-29	Troll	36	4-21-30	Random	2.0
101-29	Troll	36	4-21-43	Random	2.0
101	Troll	37	4-20-20	Random	2.1
101-21	Troll	37	4-21-30	Random	2.1
101-21	Troll	37	4-21-30	Random	2.1

-Continued-

Appendix Table 12. Recoveries of coded-wire tagged wild Hugh Smith Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
101	Troll	37	4-21-30	Random	2.1
101	Troll	37	4-21-30	Random	2.1
101-29	Troll	37	4-21-30	Random	2.1
101-29	Troll	37	4-21-30	Random	2.1
101	Troll	39	4-21-30	Random	1.4
101, 102	Troll	30	4-21-30	Random	2.1
N.B.C.	Troll	-	4-20-20	Random	4.9
N.B.C.	Troll	-	4-20-20	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
N.B.C.	Troll	-	4-21-30	Random	4.9
104-40	Seine	28	4-21-30	Random	4.2
104-20	Seine	30	4-21-30	Random	3.6
104-40	Seine	34	4-20-20	Random	3.4
106-30	Seine	34	4-21-30	Random	1.6
106-30	Seine	34	4-21-30	Random	1.6
102-80	Seine	35	4-21-30	Random	2.9
102-80	Seine	35	4-21-30	Random	2.9
102-70	Seine	35	4-20-20	Random	2.9
102-80	Seine	36	4-20-20	Random	1.9
102	Seine	36	4-20-20	Random	1.9
102	Seine	36	4-21-30	Random	1.9
102-80	Seine	36	4-21-30	Random	1.9
102-20	Seine	36	4-21-30	Random	1.9
101-41	Seine	33	4-21-30	Random	3.7
101-41	Seine	33	4-21-30	Random	3.7
101-41	Seine	33	4-21-30	Random	3.7
101	Seine	34	4-21-30	Random	3.6
101	Seine	34	4-21-30	Random	3.6
101-26	Seine	34	4-20-20	Random	3.6
101-11	Seine	34	4-20-20	Random	3.6
101-25	Seine	35	4-20-20	Random	2.9
101-25	Seine	35	4-21-30	Random	2.9
101-41	Seine	35	4-21-30	Random	2.9
101-30	Seine	35	4-21-43	Random	2.9
101	Seine	36	4-21-30	Random	1.9
101-30	Seine	36	4-21-30	Random	1.9
101, 102	Seine	36	4-21-30	Random	1.9
101, 102	Seine	36	4-21-30	Random	1.9
101, 102	Seine	36	4-21-30	Random	1.9
101, 102	Seine	36	4-21-30	Random	1.9

-Continued-

Appendix Table 12. Recoveries of coded-wire tagged wild Hugh Smith Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
106	Gillnet	31	4-20-20	Random	1.3
106-41	Gillnet	34	4-21-30	Random	1.9
106-41	Gillnet	34	4-21-30	Random	1.9
106-41	Gillnet	35	4-20-20	Random	2.3
106-41	Gillnet	36	4-20-20	Random	2.2
106-30	Gillnet	36	4-20-20	Random	2.2
106-41	Gillnet	36	4-21-30	Random	2.2
106	Gillnet	36	4-21-30	Random	2.2
106-30	Gillnet	36	4-20-18	Random	2.2
106-30	Gillnet	37	4-21-30	Random	1.6
106-30	Gillnet	37	4-21-30	Random	1.6
106-41	Gillnet	38	4-21-30	Random	1.2
108-20	Gillnet	34	4-20-20	Random	1.9
108-30	Gillnet	37	4-21-30	Random	1.6
106, 108	Gillnet	37	4-20-20	Random	1.6
106, 108	Gillnet	38	4-20-20	Random	1.2
106, 108	Gillnet	40	4-20-20	Random	2.0
101	Gillnet	33	4-21-30	Random	1.7
101-11	Gillnet	33	4-21-43	Random	1.7
101-11	Gillnet	34	4-21-30	Random	2.8
101-23	Gillnet	34	4-21-43	Random	2.8
101-11	Gillnet	35	4-21-30	Random	3.4
101-11	Gillnet	36	4-21-30	Random	2.2
101	Gillnet	36	4-21-30	Random	2.2
101	Gillnet	36	4-20-20	Random	2.2
101	Gillnet	37	4-20-20	Random	1.4
101	Gillnet	37	4-21-30	Random	1.4
101-11	Gillnet	37	4-21-30	Random	1.4
101	Gillnet	37	4-21-30	Random	1.4
101	Gillnet	37	4-21-30	Random	1.4
101-11	Gillnet	37	4-21-30	Random	1.4
101-11	Gillnet	37	4-21-30	Random	1.4
101	Gillnet	38	4-21-30	Random	0.5
101	Gillnet	38	4-21-30	Random	0.5
101	Gillnet	38	4-21-30	Random	0.5
101	Gillnet	39	4-20-20	Random	0.6
101	Gillnet	39	4-20-20	Random	0.6
N.B.C.	Net	-	4-21-30	Random	4.2
N.B.C.	Net	-	4-21-30	Random	4.2
N.B.C.	Net	-	4-21-43	Random	4.2
101-28	Trap	33	4-21-30	Random	3.1
101-28	Trap	33	4-21-30	Random	3.1
101-28	Trap	35	4-21-30	Random	2.6
101-28	Trap	35	4-21-43	Random	2.6
101-25	Unknown	35	4-21-30	Random	-
109	Troll	32	4-21-30	Select	-

-Continued-

Appendix Table 12. Recoveries of coded-wire tagged wild Hugh Smith Lake coho salmon from area-specific fishery samples, 1983 (continued).

District(s) <sup>1</sup>	Gear	Week	Tag Code	Type	Expansion
102-80	Troll	34	4-21-30	Select	-
101-41	Unknown	23	4-21-30	Select	-
101-90	Unknown	35	4-21-30	Select	-

<sup>1</sup> P - landed in Pelican; S - landed in Sitka; E - landed in Excursion Inlet;  
H - Landed in Hoonah; N.B.C. - Northern British Columbia (preliminary data).

Appendix Table 13. Recoveries of coded-wire tagged wild Kegan Lake coho salmon from area-specific fishery samples, 1983.

District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
116	Troll	38	4-21-29	Random	3.3
113-11	Troll	29	4-21-29	Random	4.7
113-41	Troll	30	4-21-29	Random	6.1
113-P	Troll	31	4-21-29	Random	5.6
113-S	Troll	31	4-21-29	Random	5.6
113-S	Troll	31	4-21-29	Random	5.6
113-S	Troll	32	4-21-29	Random	3.4
113-S	Troll	32	4-21-29	Random	3.4
113-91	Troll	32	4-21-29	Random	3.4
113-22	Troll	35	4-21-29	Random	3.4
113-81	Troll	36	4-21-29	Random	4.4
103	Troll	29	4-21-29	Random	1.9
103-90	Troll	32	4-21-29	Random	1.1
103, 104, 152	Troll	32	4-21-29	Random	1.1
109	Troll	30	4-21-29	Random	1.4
105	Troll	32	4-21-29	Random	2.1
106	Troll	30	4-21-29	Random	2.0
106-41	Troll	30	4-21-29	Random	2.0
102-30	Troll	35	4-21-29	Random	1.9
102-30	Troll	36	4-21-29	Random	2.0
101	Troll	32	4-21-29	Random	1.4
101	Troll	37	4-21-29	Random	2.1
101-29	Troll	38	4-21-29	Random	2.3
104	Seine	35	4-21-29	Random	2.3
103-30	Seine	34	4-21-29	Random	3.4
102-70	Seine	35	4-21-29	Random	2.9
102-80	Seine	35	4-21-29	Random	2.9
102-80	Seine	35	4-21-29	Random	2.9
102-80	Seine	36	4-21-29	Random	1.9
101-41	Seine	35	4-21-29	Random	2.9
106-41	Gillnet	33	4-21-29	Random	3.6
106-41	Gillnet	34	4-21-29	Random	1.9
106-41	Gillnet	35	4-21-29	Random	2.3
106-41	Gillnet	36	4-21-29	Random	2.2
106-41	Gillnet	37	4-21-29	Random	1.6
106, 108	Gillnet	38	4-21-29	Random	1.2
101-11	Gillnet	37	4-21-29	Random	1.4

<sup>1</sup> P-landed in Pelican; S-landed in Sitka.

Appendix Table 14. Recoveries of coded-wire tagged wild coho salmon returning to Reflection and McDonald Lakes from area-specific fishery samples, 1983.

System	District(s) <sup>1</sup>	Gear	Statistical Week	Tag Code	Recovery Type	Expansion
Reflection Lake	113-S	Troll	28	4-21-31	Random	5.7
	102-10	Troll	29	4-21-31	Random	2.2
	106-30	Gillnet	31	4-21-31	Random	1.3
	101-90	Sport	28	4-21-31	Random	10.3
McDonald Lake	113-71	Troll	29	4-21-42	Random	4.7
	109	Troll	31	4-21-42	Random	2.7
	109	Troll	32	4-21-32	Random	2.1
	105-10	Troll	35	4-21-42	Random	0.8

<sup>1</sup> S - Landed in Sitka.

Appendix Table 15. Wild coho salmon escapement counts at the Auke Creek weir, 1971-1984.

Year	Adults	Jacks <sup>1</sup>	Comments
1971	308	608	
1972	967	146	
1973	399	238	
1974	768	379	
1975	1,310	98	
1976	272	182	Washed out 3 October
1977	889	596	
1978	683	256	
1979	596	107	Washed out 3 days
1980	698	276	
1981	644	231	
1982	447	338	
1983	694	261	
1984	651	315	

<sup>1</sup> Age .0

Appendix Table 16. Berners River coho salmon escapement surveys, 1960-1984.

Year	Date	Count	Method	Remarks
1960	6 October	6,000	Aerial	
1961	25 September	600	Aerial	Poor visibility
1968	23 September	2,500	Aerial	Schooled in pools
	11 October	5,000	Aerial	
1969	1 October	5,000	Aerial	Lower 22 km surveyed
	14 October	320	Aerial	
	22 October	345	Boat	
	23 October	1,600	Aerial	
1970	5 October	3,000	Aerial	
1971	12 October	3,600	Aerial	
1972	6 October	4,200	Aerial	
	13 October	3,800	Aerial	
	20 October	1,500	Aerial	
	2 November	1,100	Aerial	
1973	5 October	300	Aerial	Lower 3 km surveyed 300 intertidal; 1,700 river
	10 October	2,000	Aerial	
1974	4 October	820	Aerial	Lower river surveyed
	28 October	620	Aerial	
	6 November	4,121	Foot	
1975	24 September	140	Aerial	
	22 October	3,500	Aerial	
	28 October	4,342	Foot	
1976	12 October	1,500	Aerial	
	21 October	3,600	Aerial	
	5 November	1,820	Foot	
1977	1 September	-	Aerial	
	26 September	700	Aerial	
	3 October	1,600	Aerial	
	19 October	2,500	Aerial	
	23 October	3,200	Aerial	
	26 October	1,400	Aerial	
	9 November	2,200	Helicopter	
1978	21 September	50	Aerial	
	25 September	200	Aerial	

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Appendix Table 16. Berners River coho salmon escapement surveys, 1960-1984  
(continued).

Year	Date	Count	Method	Remarks
1978	16 October	1,370	Aerial	300 in lower river
	8 November	3,108	Foot	
	13 November	500	Aerial	Poor visibility
1979	10 September	90	Aerial	Poor visibility
	19 September	-	Aerial	Poor visibility
	19 October	900	Aerial	All in pools
	25 October	910	Aerial	
	4 November	3,460	Foot	
	6 November	1,600	Aerial	
	7 November	2,900	Aerial	
1980	12 September	840	Aerial	
	13 October	890	Aerial	All in pools
	31 October	2,300	Aerial	Most in pools
	7 November	2,820	Helicopter	Some foot counts
1981	7 October	7,170	Aerial	All in pools
	2 November	4,420	Helicopter	Most in pools
1982	9 September	20	Aerial	
	22 September	850	Aerial	
	19 October	9,000	Aerial	Still in pools
	1 November	3,500	Aerial	400 in Moose Slough
	5 November	7,505	Foot	400 in Moose Slough
1983	7 September	125	Aerial	
	20 September	1,000	Foot	Lower 3 km surveyed
	27 September	9,800	Aerial	1,500 in Moose Slough
	27 September	13,000	Aerial	In pools
	31 October	9,840	Foot	770 in Moose Slough
1984	5 September	50	Aerial	Not in pools yet
	11 September	455	Aerial	Most below Moose Slough
	18 September	300	Aerial	250 below Moose Slough
	19 September	585	Aerial	
	21 September	525	Aerial	480 upper, 45 lower
	24 September	1,180	Aerial	
	28 September	2,150	Aerial	Lower school building
	4 October	1,400	Aerial	450 in lower river
	16 October	3,000	Aerial	
	24 October	2,825	Foot	625 in Moose Slough

Appendix Table 17. Estimated total return, harvest by area, and escapement of coho salmon returns to Auke Lake, 1978, 1980, 1981, 1982, and 1983.

Area	1978	1980	1981	1982	1983	Average	Average % of Total
Northern Outside 116, 157, 181, 183, 186, 189	-	40 (4.8%)	48 (5.4%)	19 (2.4%)	212 (19.1%)	64	6.3
Central Outside 113, 154	30 (1.9%)	31 (3.7%)	38 (4.3%)	24 (3.0%)	19 (1.7%)	28	2.9
Southern Outside 103, 104, 152	-	-	-	-	4 (0.4%)	1	0.1
Central Inter- mediate 112, 114	577 (36.5%)	20 (2.4%)	128 (14.6%)	262 (32.6%)	91 (8.2%)	216	18.9
Southern Inter- mediate 105, 109, 110	-	5 (0.6%)	-	23 (2.8%)	7 (0.6%)	7	0.8
Lynn Canal 115	29 (1.8%)	-	2 (0.2%)	7 (0.9%)	19 (1.7%)	12	0.9
Stephens Passage 111	261 (16.5%)	37 (4.5%)	17 (1.9%)	22 (2.7%)	65 (5.8%)	80	6.3
Northern British Columbia	-	-	5 - (0.6%)	-	-	1	0.1
Total Catch	897 (56.7%)	133 (16.0%)	238 (27.0%)	357 (44.4%)	417 (37.5%)	409	36.3
Escapement	683 (43.3%)	698 (84.0%)	644 (73.0%)	447 (55.6%)	694 (62.5%)	633	63.7
Total Return	1,580 (100%)	831 (100%)	882 (100%)	804 (100%)	1,111 (100%)	1,042	100

Appendix Table 18. Estimated total return, harvest by area, and escapement of coho salmon returns to Speel Lake, 1978, 1979, 1981, 1982, and 1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Central Intermediate 112, 114	Southern Intermediate 105, 109, 110	Lynn Canal 115	Stephens Passage 111	Central Inside 106-108	Total Catch	Escape- ment	Total Return
1978	91 (2.3%)	302 (7.7%)	-	567 (14.5%)	997 (25.4%)	-	663 (16.9%)	-	2,620 (66.8%)	1,300 (33.2%)	3,920 (100%)
1979	289 (8.2%)	611 (17.4%)	-	195 (5.5%)	217 (6.2%)	-	395 (11.2%)	-	1,707 (48.5%)	1,811 (51.5%)	3,518 (100%)
1981	43 (1.3%)	276 (8.5%)	-	541 (16.7%)	314 (9.7%)	-	129 (4.0%)	-	1,303 (40.2%)	1,935 (59.8%)	3,238 (100%)
1982	141 (3.5%)	650 (15.9%)	391 (9.6%)	1,122 (27.5%)	440 (10.8%)	37 (0.9%)	131 (3.2%)	-	2,912 (71.4%)	1,164 (28.6%)	4,076 (100%)
1983	426 (11.8%)	596 (16.5%)	-	480 (13.2%)	202 (5.6%)	24 (0.7%)	83 (2.3%)	8 (0.2%)	1,819 (50.3%)	1,797 (49.7%)	3,616 (100%)
Average	198	487	78	581	434	12	280	2	2,072	1,601	3,673
Average % of Total	5.4	13.2	1.9	15.5	11.6	0.3	7.5	0.0	55.4	44.6	100%

Appendix Table 19. Estimated total return, harvest by area, and escapement of coho salmon returns to the Berners River, 1978, 1979, 1982, and 1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Central Intermediate 112, 114	Southern Intermediate 105, 109, 110	Stephens Passage 111	Lynn Canal 115	Total Catch	Escapement	Total Return
1978	1,775 (13.0%)	247 (1.8%)	3,890 (28.4%)	-	307 (2.2%)	4,348 (31.8%)	10,567 (77.2%)	3,119 (22.8%)	13,686 (100%)
1979	900 (11.0%)	1,347 (16.4%)	461 (5.6%)	-	137 (1.7%)	1,883 (23.0%)	4,728 (57.7%)	3,460 (42.3%)	8,188 (100%)
1982	2,737 (10.4%)	927 (3.5%)	5,463 (20.8%)	-	-	9,679 (36.8%)	18,806 (71.5%)	7,505 (28.5%)	26,311 (100%)
1983	9,208 (28.1%)	2,450 (7.5%)	4,972 (15.2%)	144 (0.4%)	332 (1.0%)	5,819 (17.8%)	22,925 (70.0%)	9,840 (30.0%)	32,765 (100%)
Average	3,655	1,243	3,696	36	194	5,432	14,256	5,981	20,237
Average % of Total	15.6	7.3	17.5	0.1	1.2	27.4	69.1	30.9	100

Appendix Table 20. Estimated total return, harvest by area, and escapement of coho salmon returns to Chilkoot Lake, 1979 and 1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Central Intermediate 112, 114	Stephens Passage 111	Lynn Canal 115	Chilkoot River & Lake	Total Catch	Escape- ment	Total Return
1979	1,145 (29.7%)	-	-	234 (6.1%)	-	1,466 (38.0%)	258 (6.7%)	3,103 (80.5%)	750 (19.5%)	3,853 (100%)
1983	2,287 (25.4%)	775 (8.6%)	510 (5.7%)	897 (10.0%)	265 (3.0%)	2,446 (27.2%)	707 (7.9%)	7,887 (87.8%)	1,100 (12.2%)	8,987 (100%)
Average	1,716	388	255	566	132	1,956	482	5,495	925	6,420
Average % of Total	27.6	4.3	2.8	8.1	1.5	32.6	7.3	84.2	15.8	100

Appendix Table 21. Estimated total return, harvest by area, and escapement of coho salmon returns to Chilkat Lake, 1978, 1979, and 1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Central Intermediate 112, 114	Southern Intermediate 105, 109, 110	Southern Inside 101, 102	Stephens Passage 111	Lynn Canal 115	Total Catch	Escape- ment	Total Return
1978	199 (5.9%)	-	1,561 (46.4%)	-	-	275 (8.2%)	891 (26.5%)	2,926 (87.0%)	438 (13.0%)	3,364 (100%)
1979	203 (8.0%)	466 (18.3%)	-	-	-	-	907 (35.7%)	1,576 (62.0%)	966 (38.0%)	2,542 (100%)
1983	11,558 (26.4%)	3,980 (9.1%)	8,429 (19.3%)	514 (1.2%)	338 (0.8%)	-	17,843 (40.8%)	42,662 (97.6%)	1,028 (2.4%)	43,690 (100%)
1983 <sup>1</sup> (ad- justed)	11,558 (23.5%)	3,980 (8.0%)	8,429 (17.1%)	514 (1.1%)	338 (0.7%)	-	17,843 (36.2%)	42,662 (86.6%)	6,582 (13.4%)	49,244 (100%)
Average <sup>2</sup>	3,986	1,482	3,330	171	113	92	6,547	15,721	2,662	18,383
Average % of Total <sup>2</sup>	12.5	8.8	21.1	0.4	0.2	2.7	32.8	78.5	21.5	100

<sup>1</sup> Estimates adjusted under the assumption that the troll and purse seine harvest rate for Chilkat Lake was the same as the average estimate for the Berners River and Chilkoot Lake stocks (see text).

<sup>2</sup> Average includes only the adjusted estimates for 1983.

Appendix Table 22. Estimated total return, harvest by area, and escapement of coho salmon returns to Ford Arm Lake, 1982-1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Central Intermediate 112, 114	Southern Intermediate 105, 109, 110	Central Inside 106, 108	Total Catch	Escapement	Total Return
1982	136 (3.1%)	1,040 (23.8%)	218 (5.0%)	274 (6.3%)	-	33 (0.8%)	1,701 (39.0%)	2,662 (61.0%)	4,363 (100%)
1983	951 (15.9%)	2,848 (47.6%)	34 (0.6%)	195 (3.2%)	14 (0.2%)	-	4,042 (67.5%)	1,944 (32.5%)	5,986 (100%)
Average	544	1,944	126	234	7	16	2,871	2,303	5,174
Average % of Total	9.5	35.7	2.8	4.7	0.1	0.4	53.2	46.8	100

Appendix Table 23. Estimated total return, harvest by area, and escapement of coho salmon returns to Politofski Lake, 1982-1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Central Intermediate 112, 114	Total Catch	Escapement	Total Return
1982	61 (2.4%)	675 (26.0%)	131 (5.0%)	867 (33.4%)	1,731 (66.6%)	2,598 (100%)
1983	-	373 (33.8%)	-	373 (33.8%)	732 (66.2%)	1,105 (100%)
Average	30	524	66	620	1,232	1,852
Average % of Total	1.2	29.9	2.5	33.6	66.4	100



Appendix Table 24. Estimated total return, harvest by area, and escapement of coho salmon returns to Warm Chuck Lake, 1982-1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Southern Intermediate 105, 109, 110	Southern Inside 101, 102	Total Catch	Escapement	Total Return
1982	199 (7.2%)	158 (5.8%)	1,331 (48.4%)	-	44 (1.6%)	1,732 (63.0%)	1,017 (37.0%)	2,749 (100%)
1983	-	216 (8.5%)	920 (36.4%)	99 (3.9%)	56 (2.2%)	1,291 (51.0%)	1,238 (49.0%)	2,529 (100%)
Average	100	187	1,125	50	50	1,512	1,127	2,639
Average % of Total	3.6	7.1	42.4	2.0	1.9	57.0	43.0	100

Appendix Table 25. Estimated total return, harvest by area, and escapement of coho salmon returns to Klakas Lake, 1982-1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Southern Intermediate 105, 109, 110	Southern Inside 101, 102	Total Catch	Escapement	Total Return
1982	77 (2.9%)	209 (7.8%)	1,258 (46.8%)	132 (4.9%)	383 (14.3%)	2,059 (76.7%)	627 (23.3%)	2,686 (100%)
1983	-	576 (15.4%)	1,484 (39.6%)	123 (3.3%)	230 (6.2%)	2,413 (64.5%)	1,328 (35.5%)	3,741 (100%)
Average	38	393	1,371	128	306	2,236	978	3,214
Average % of Total	1.4	11.6	43.2	4.1	10.3	70.6	29.4	100

Appendix Table 26. Estimated total return, harvest by area, and escapement of coho salmon returns to Hugh Smith Lake, 1982-1983.

Year	Northern Outside 116, 157, 181 183, 186, 189	Central Outside 113, 154	Southern Outside 103, 104, 152	Central Intermediate 112, 114	Southern Intermediate 105, 109, 110	Central Inside 106-108	Southern Inside 101, 102	Northern British Columbia	Total Catch	Escape- ment	Total Return
1982	-	1,152 (19.1%)	768 (12.8%)	65 (1.1%)	376 (6.2%)	52 (0.9%)	1,107 (18.4%)	356 (5.9%)	3,876 (64.4%)	2,144 (35.6%)	6,020 (100%)
1983	237 (6.2%)	520 (13.7%)	266 (7.0%)	54 (1.4%)	107 (2.8%)	181 (4.7%)	696 (18.3%)	260 (6.8%)	2,321 (60.9%)	1,490 (39.1%)	3,811 (100%)
Average	118	836	517	60	242	116	902	308	3,099	1,817	4,916
Average % of Total	3.1	16.4	9.9	1.2	4.5	2.8	18.3	6.4	62.6	37.4	100

Appendix Table 27. Estimated harvest rates<sup>1</sup> for Auke Lake coho salmon by area, 1978, 1980, 1981, 1982, and 1983.

Year	Outside 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189	Intermediate 105, 109, 110 112, 114	Inside (Drift Gillnet)	Inside (Troll)	Inside (Sport)	Total
1978	1.9%	37.2%	3.0%	17.6%	9.2%	56.7%
1980	8.5%	3.3%	2.7%	-	2.3%	16.0%
1981	10.3%	16.2%	0.3%	-	2.6%	27.0%
1982	5.3%	37.4%	4.8%	-	1.3%	44.4%
1983	21.2%	11.2%	3.2%	-	7.6%	37.5%
Average	9.4%	21.1%	2.8%	3.5%	4.6%	36.3%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

Appendix Table 28. Estimated harvest rates<sup>1</sup> for Speel Lake coho salmon by area, 1978, 1979, 1981, 1982, and 1983.

Year	Outside 103, 104, 113, 152, 154, 157, 181, 183, 186, 189	Intermediate 105, 109, 110 112, 114	Inside (Troll)	Inside (Sport)	Inside (Drift Gillnet)	Total
1978	10.0%	44.3%	15.2%	7.4%	14.4%	66.8%
1979	25.6%	15.7%	1.3%	6.0%	11.4%	48.5%
1981	9.9%	29.3%	-	2.5%	3.9%	40.2%
1982	29.0%	54.0%	-	-	12.6%	71.4%
1983	28.3%	26.3%	-	2.8%	2.9%	50.3%
Average	20.6%	33.9%	3.3%	3.7%	9.0%	55.4%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

Appendix Table 29. Estimated harvest rates<sup>1</sup> for Berners River coho salmon by area, 1978, 1979, 1982, and 1983.

Year	Outside 113, 116, 154, 157 181, 183, 186, 189	Intermediate 105, 109, 110 112, 114	Inside (Troll)	Inside (Sport)	Inside (Drift Gillnet)	Total
1978	14.8%	33.4%	2.9%	1.1%	58.2%	77.2%
1979	27.4%	7.8%	-	2.5%	35.2%	57.7%
1982	13.9%	24.1%	-	-	56.3%	71.5%
1983	35.6%	24.2%	-	2.1%	37.2%	70.0%
Average	22.9%	22.4%	0.7%	1.4%	46.7%	69.1%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

Appendix Table 30. Estimated harvest rates<sup>1</sup> for Chilkoot Lake coho salmon by area, 1979 and 1983.

Year	Outside 103, 104, 113, 116, 152, 154 157, 181, 183, 186, 189	Intermediate 112, 114	Inside (Drift Gillnet)	Inriver Sport	Total
1979	29.7%	8.6%	59.3%	25.6%	80.5%
1983	39.7%	16.6%	60.0%	39.1%	87.8%
Average	34.7%	12.6%	59.6%	32.4%	84.2%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

Appendix Table 31. Estimated harvest rates<sup>1</sup> for Chilkat Lake coho salmon by area, 1978, 1979, and 1983.

Year	Outside 113, 116, 154, 157 181, 183, 186, 189	Intermediate 105, 109, 110 112, 114	Inside (Troll)	Inside (Drift Gillnet)	Total
1978	5.9%	49.3%	17.1%	67.0%	87.0%
1979	26.3%	-	-	48.4%	62.0%
1983 <sup>2</sup>	31.5%	26.8%	-	73.7%	86.6%
Average	21.2%	25.4%	5.7%	63.0%	78.5%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Estimates adjusted under the assumption that the troll and purse seine harvest rate for Chilkat Lake was the same as the average estimate for the Berners River and Chilkoot Lake stocks (see text).



Appendix Table 32. Estimated harvest rates<sup>1</sup> for Ford Arm Lake coho salmon by area, 1982-1983.

Year	Outside Waters <sup>2</sup>	Intermediate Waters <sup>3</sup>	Inside Waters <sup>4</sup>	Total
1982	31.9%	6.3%	0.8%	39.0%
1983	64.1%	3.4%	-	67.5%
Average	48.0%	4.8%	0.4%	53.2%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

<sup>3</sup> Districts 105, 109, 110, 112, 114.

<sup>4</sup> Districts 101, 102, 106, 107, 108, 111, 115.

Appendix Table 33. Estimated harvest rates<sup>1</sup> for Politofski Lake coho salmon by area, 1982-1983.

Year	Outside Waters <sup>2</sup>	Intermediate Waters <sup>3</sup>	Inside Waters <sup>4</sup>	Total
1982	28.4%	5.0%	-	33.4%
1983	33.8%	-	-	33.8%
Average	31.1%	2.5%	-	33.6%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

<sup>3</sup> Districts 105, 109, 110, 112, 114.

<sup>4</sup> Districts 101, 102, 106, 107, 108, 111, 115.

Appendix Table 34. Estimated harvest rates<sup>1</sup> for Warm Chuck Lake coho salmon by area, 1982-1983.

Year	Outside Waters <sup>2</sup>	Intermediate Waters <sup>3</sup>	Inside Waters <sup>4</sup>	Total
1982	61.4%	-	1.6%	63.0%
1983	44.9%	3.9%	2.2%	51.0%
Average	53.1%	2.0%	1.9%	57.0%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

<sup>3</sup> Districts 105, 109, 110, 112, 114.

<sup>4</sup> Districts 101, 102, 106, 107, 108, 111, 115.

Appendix Table 35. Estimated harvest rates<sup>1</sup> for Klakas Lake coho salmon by area, 1982-1983.

Year	Outside Waters <sup>2</sup>	Intermediate Waters <sup>3</sup>	Inside Waters <sup>4</sup>	Total
1982	57.5%	4.9%	14.3%	76.7%
1983	55.0%	3.3%	6.2%	64.5%
Average	56.3%	4.1%	10.2%	70.6%

<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

<sup>3</sup> Districts 105, 109, 110, 112, 114.

<sup>4</sup> Districts 101, 102, 106, 107, 108, 111, 115.

Appendix Table 36. Estimated harvest rates<sup>1</sup> for Hugh Smith Lake coho salmon by area, 1982-1983.

Year	Southeastern Alaska Outside Waters	Canadian Waters	Intermediate Waters <sup>3</sup>	Inside Waters <sup>4</sup>	Total
1982	31.9%	5.9%	7.3%	35.1%	64.4%
1983	26.9%	6.8%	4.2%	37.1%	60.9%
Average	29.4%	6.3%	5.8%	36.1%	62.6%

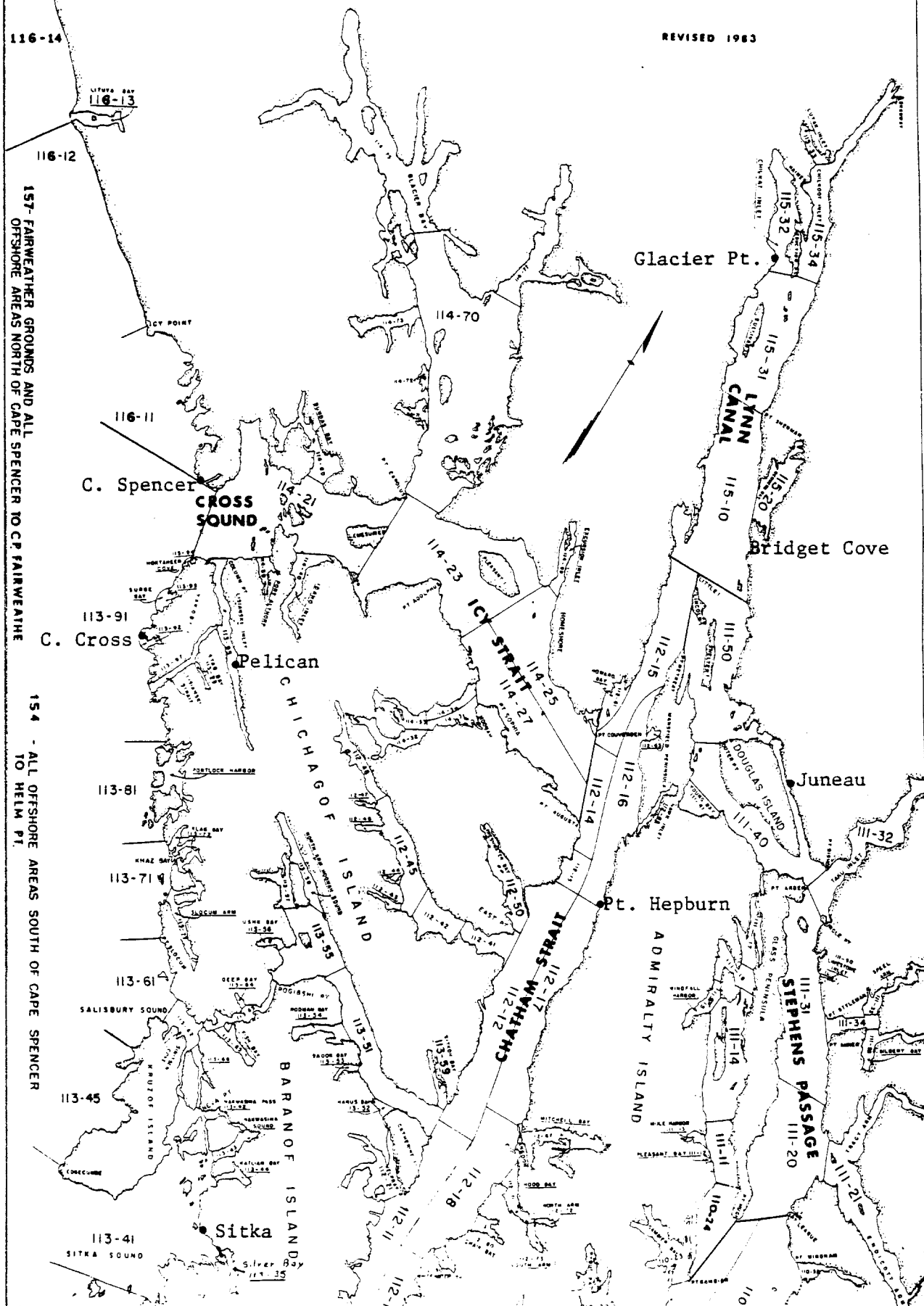
<sup>1</sup> Harvest rate is defined as the proportion of a stock available in an area that is harvested by fisheries in that area.

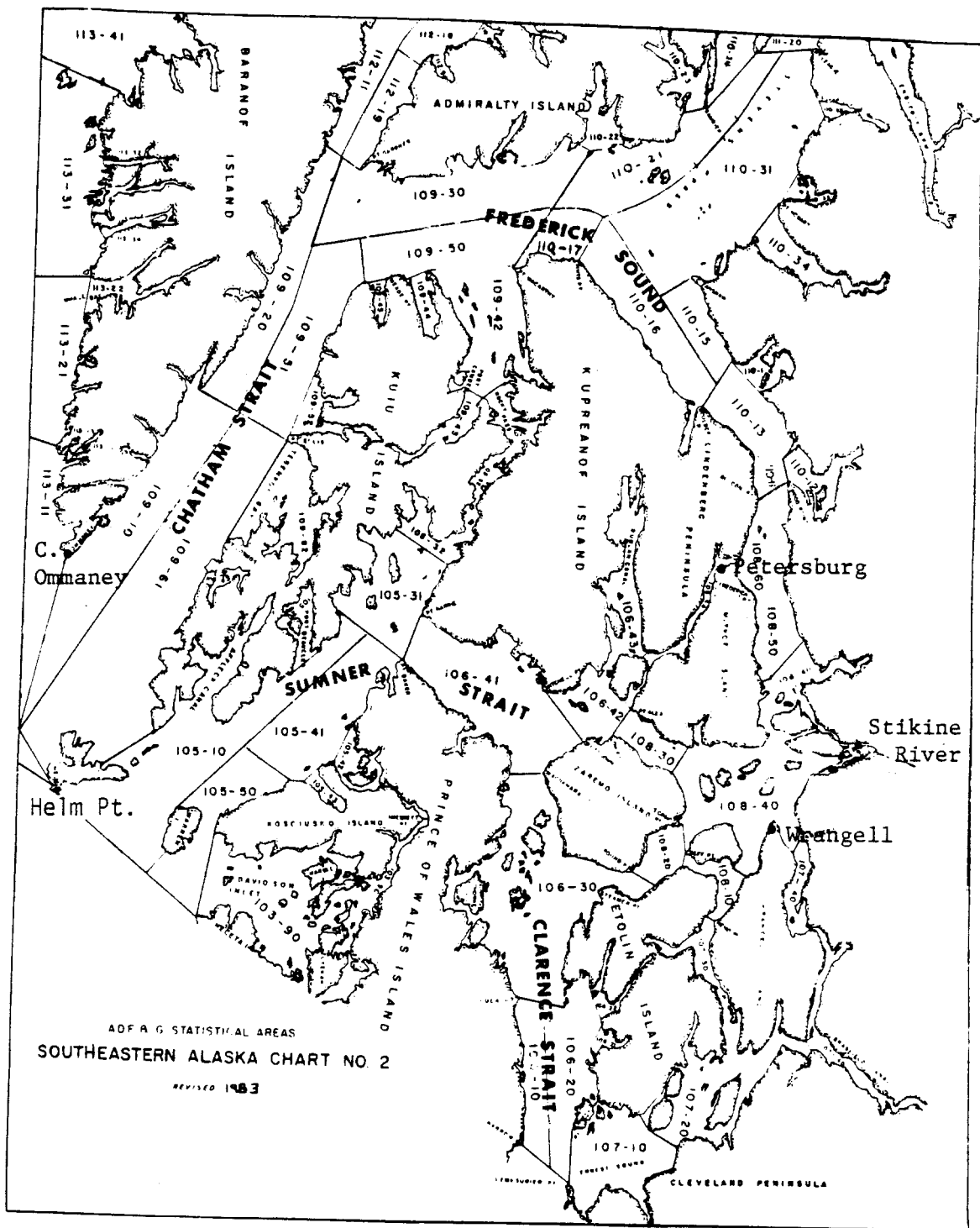
<sup>2</sup> Districts 103, 104, 113, 116, 152, 154, 157, 181, 183, 186, 189.

<sup>3</sup> Districts 105, 109, 110, 112, 114.

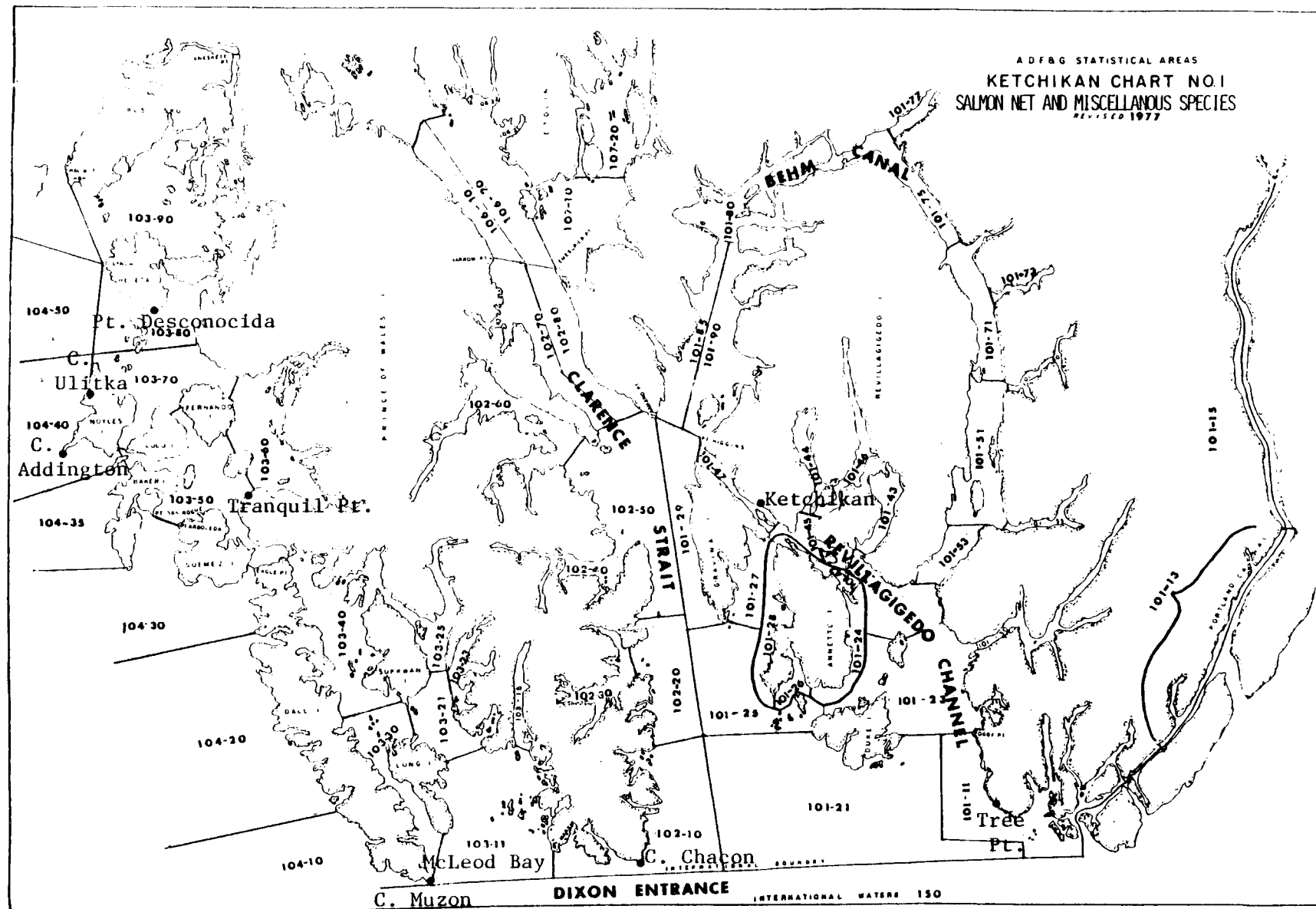
<sup>4</sup> Districts 101, 102, 106, 107, 108, 111, 115.

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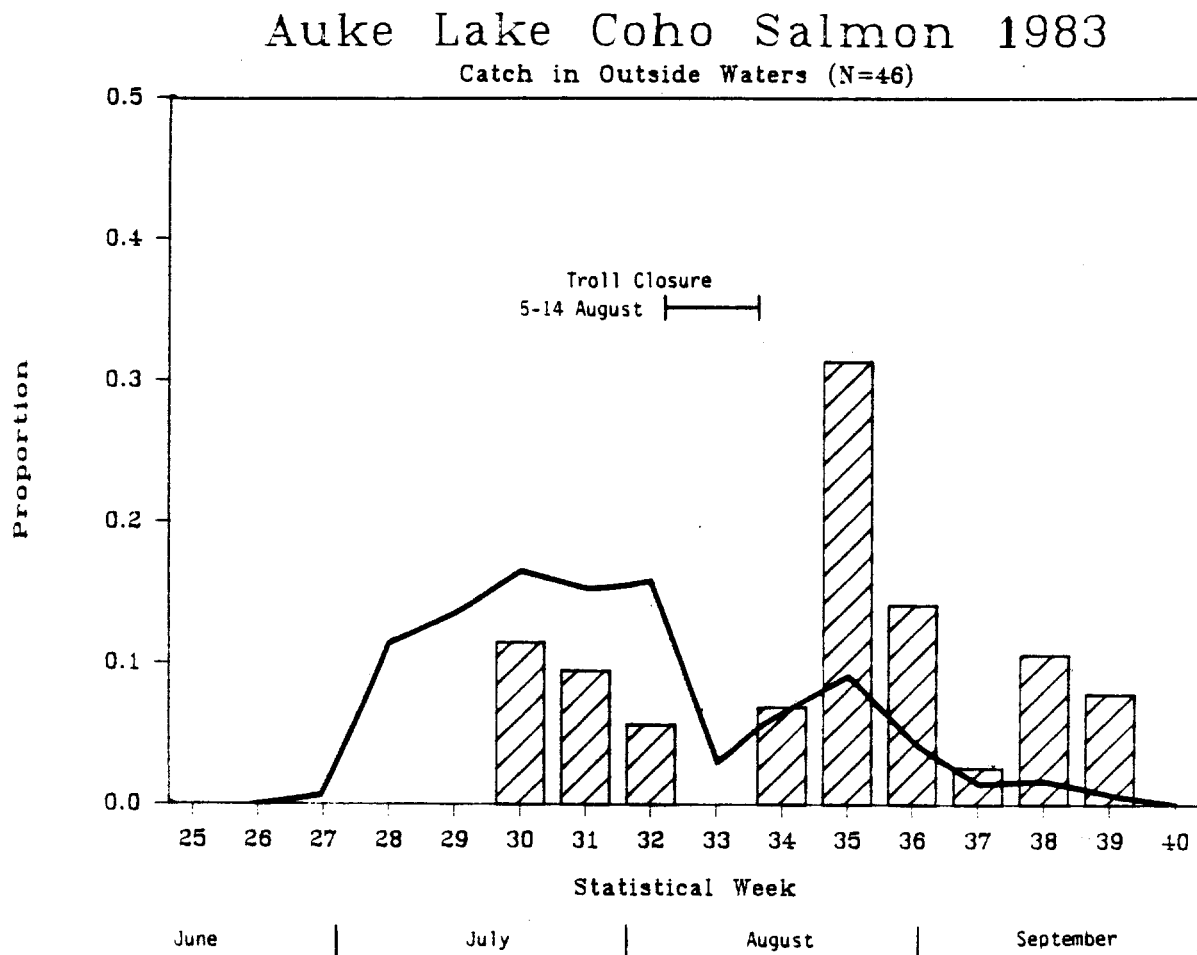
Appendix Figure 2. Central Southeastern Alaska statistical areas.



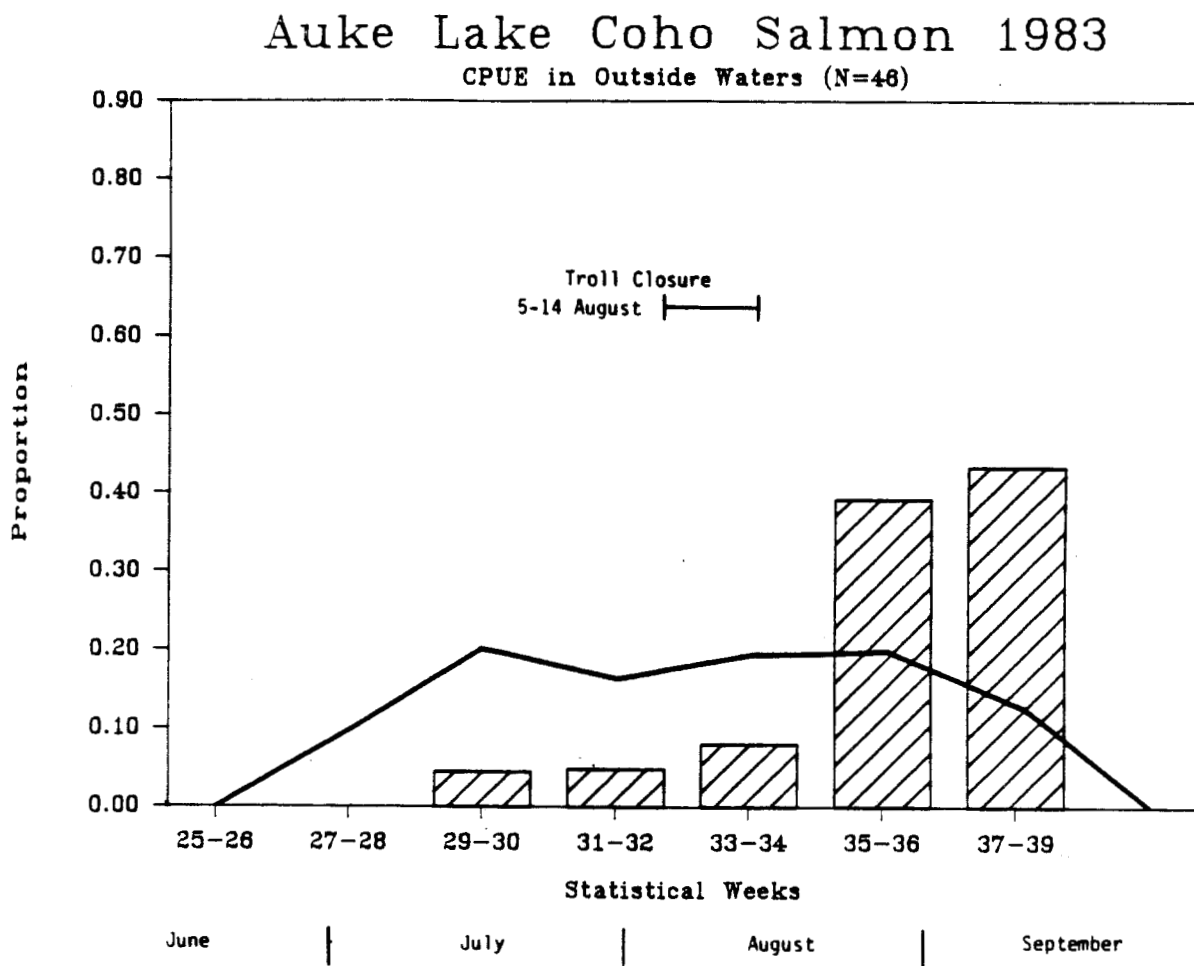
Appendix Figure 3. Southern Southeastern Alaska statistical areas.







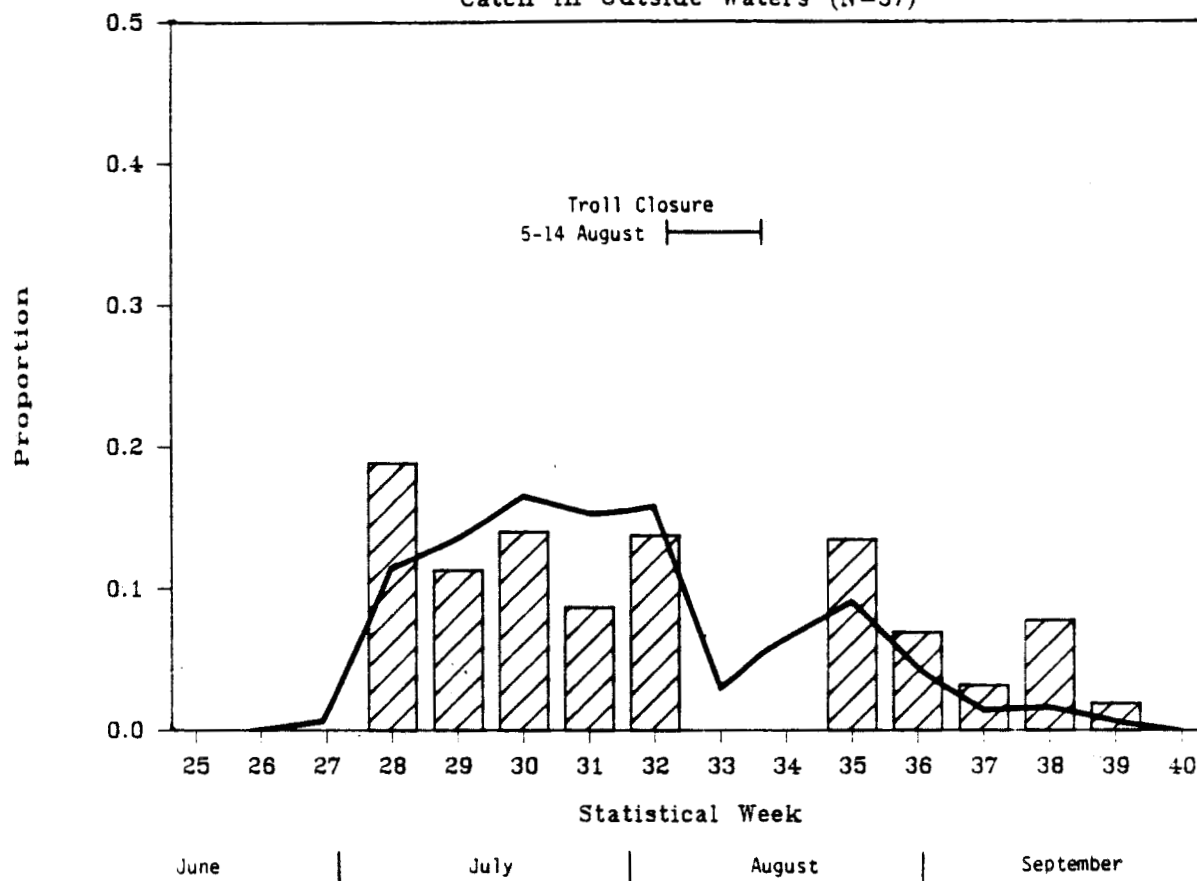
Appendix Figure 5. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Auke Lake coho salmon (bar graph) in outside waters, 1983.



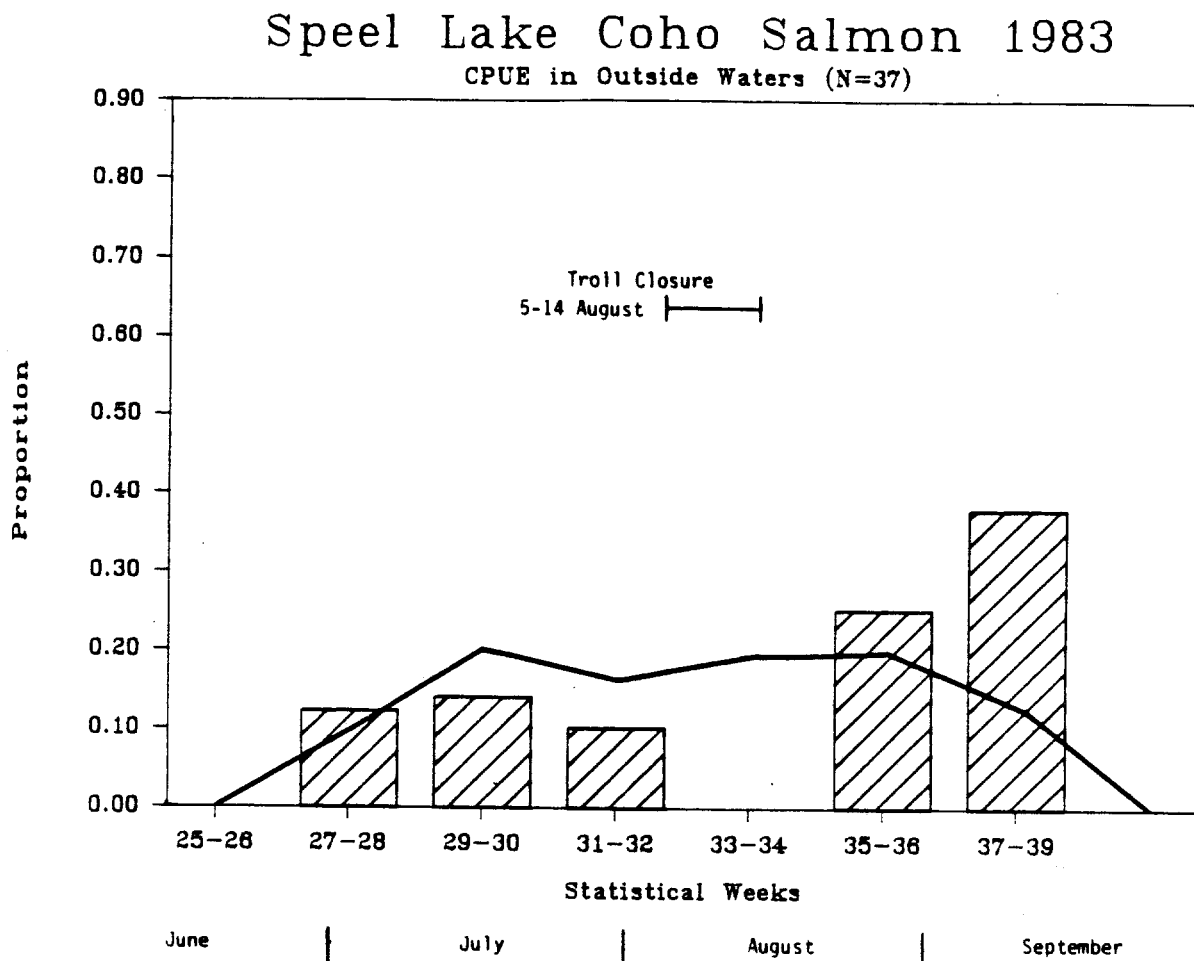
Appendix Figure 6. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Auke Lake coho salmon (bar graph) in outside waters, 1983

# Speel Lake Coho Salmon 1983

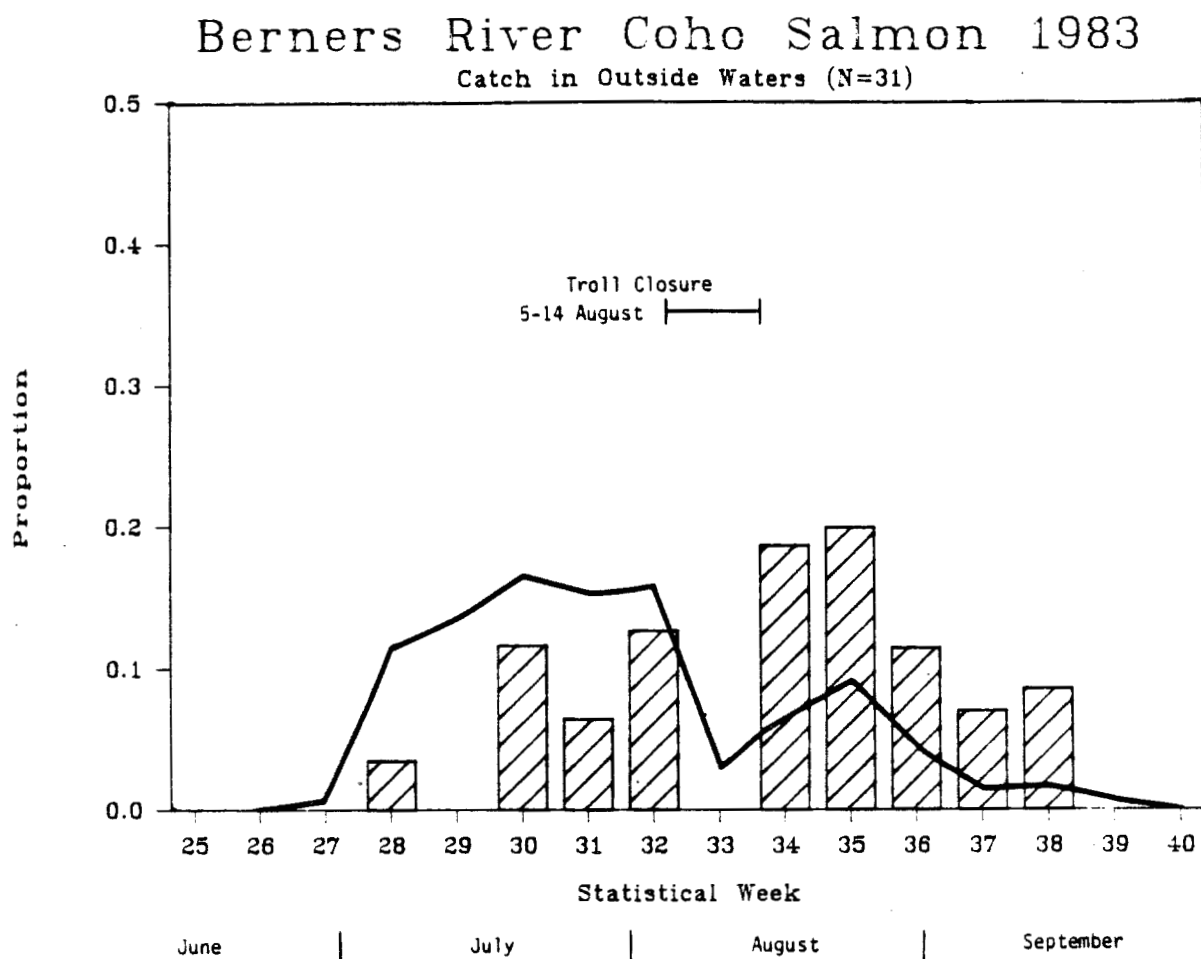
Catch in Outside Waters (N=37)



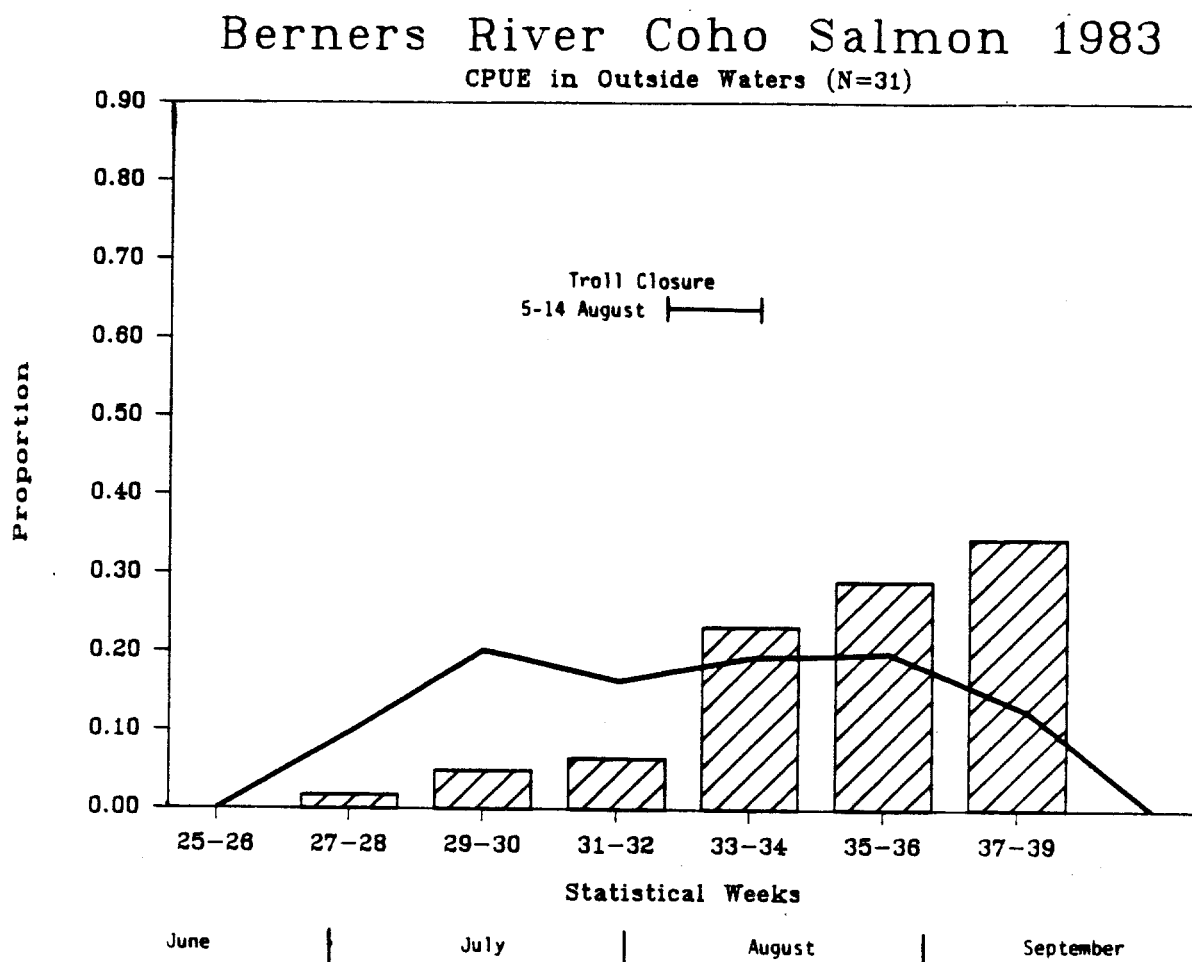
Appendix Figure 7. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Speel Lake coho salmon (bar graph) in outside waters, 1983



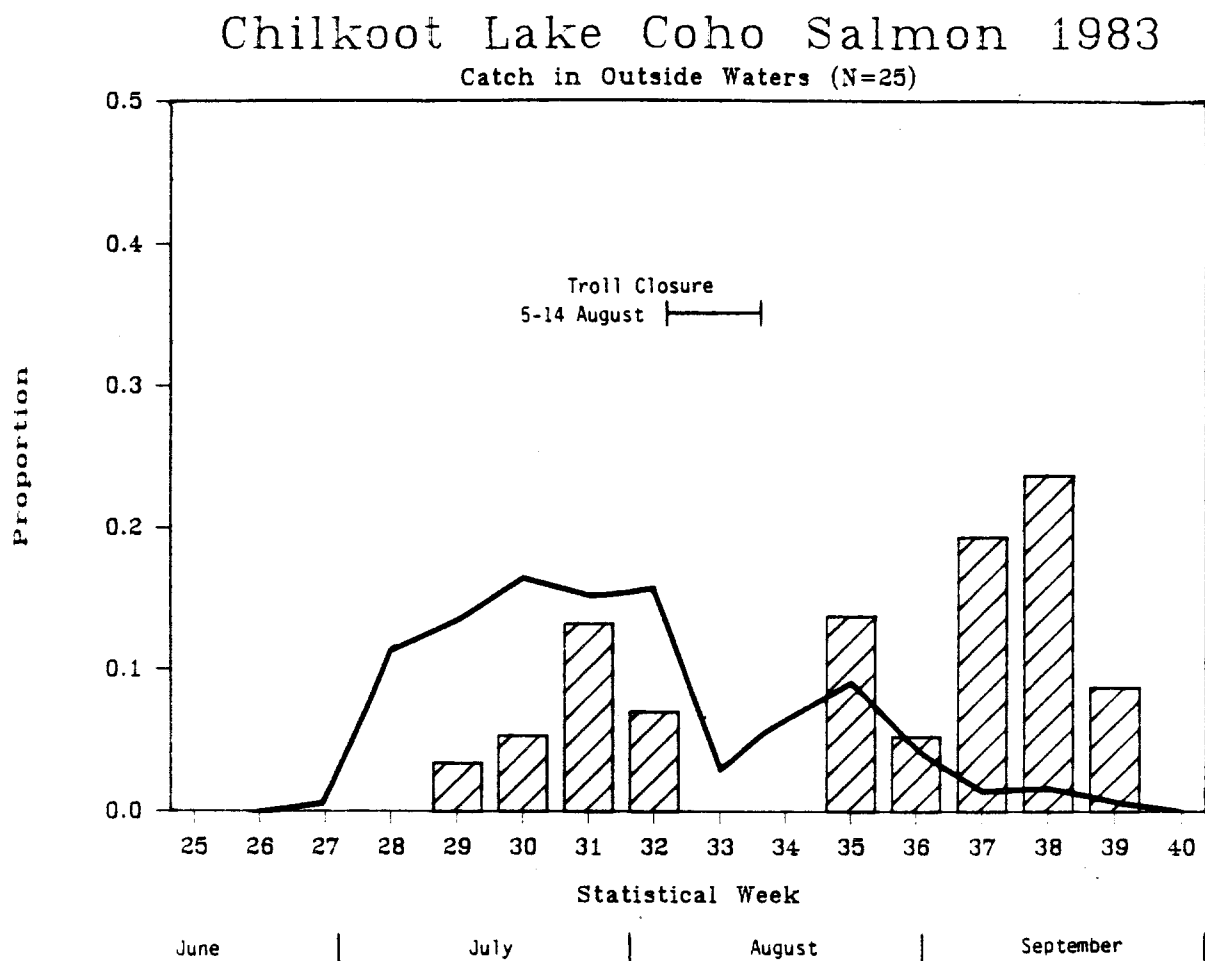
Appendix Figure 8. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Speel Lake coho salmon (bar graph) in outside waters, 1983



Appendix Figure 9. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Berners River coho salmon (bar graph) in outside waters, 1983.

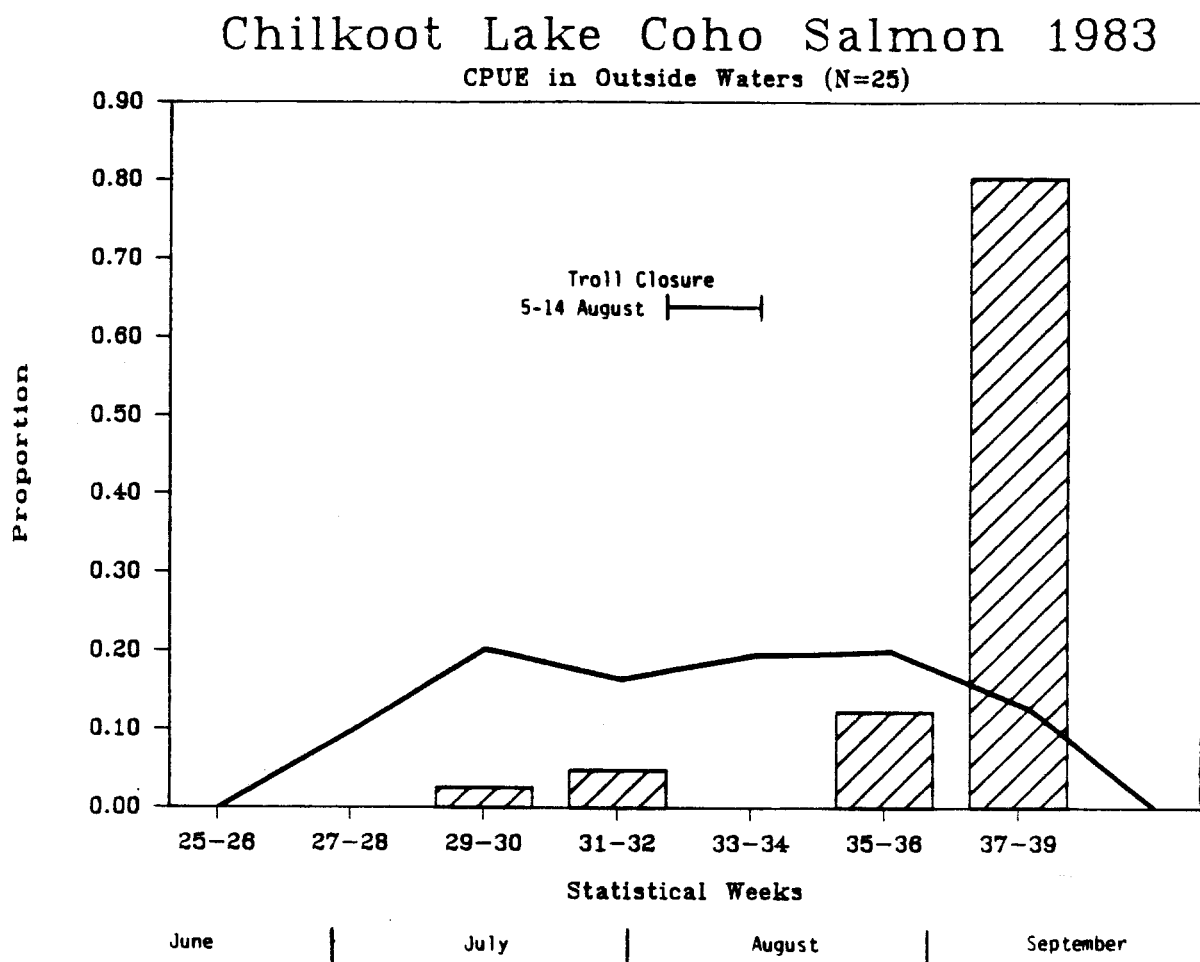


Appendix Figure 10. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Berners River coho salmon (bar graph) in outside waters, 1983.

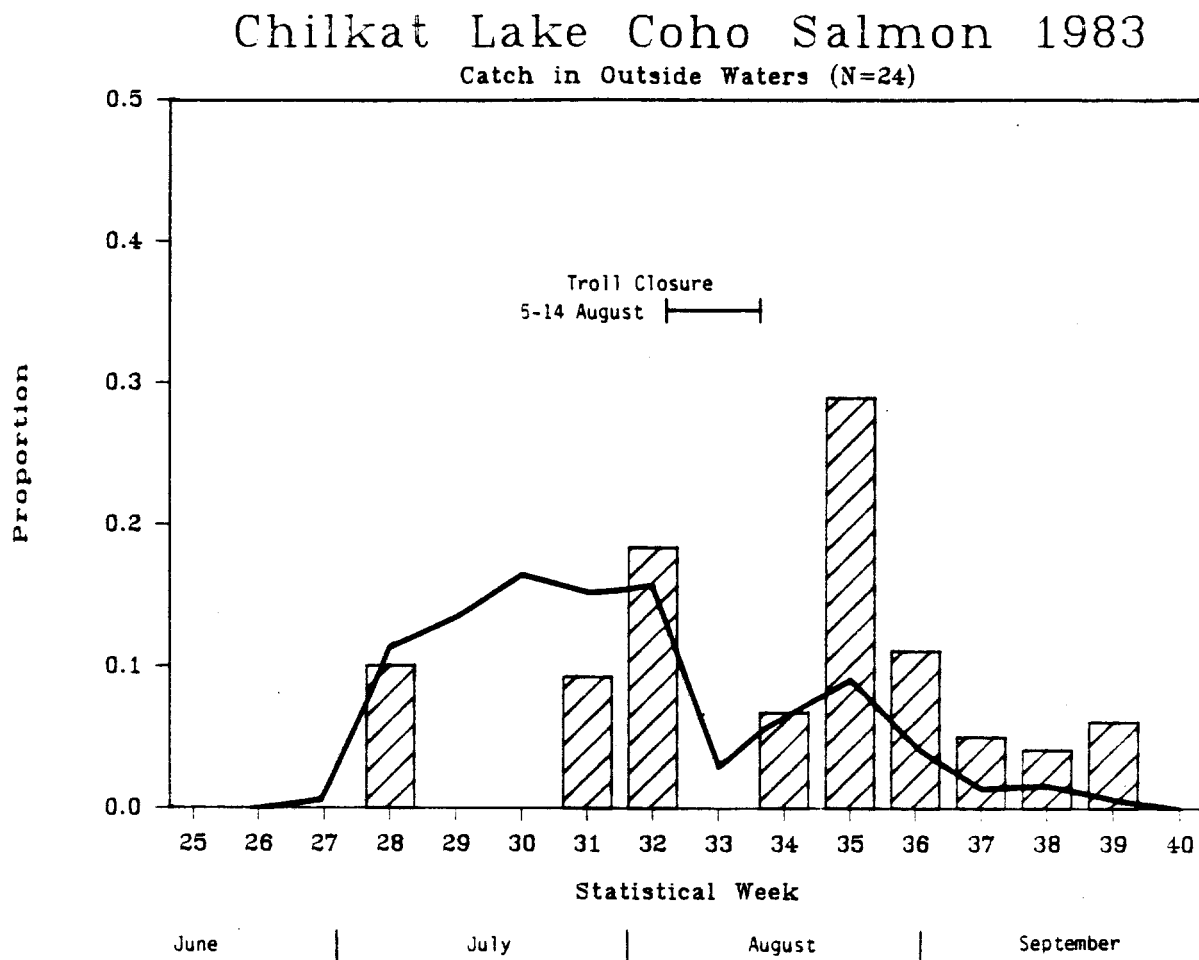


Appendix Figure 11. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Chilkoot Lake coho salmon (bar graph) in outside waters, 1983.





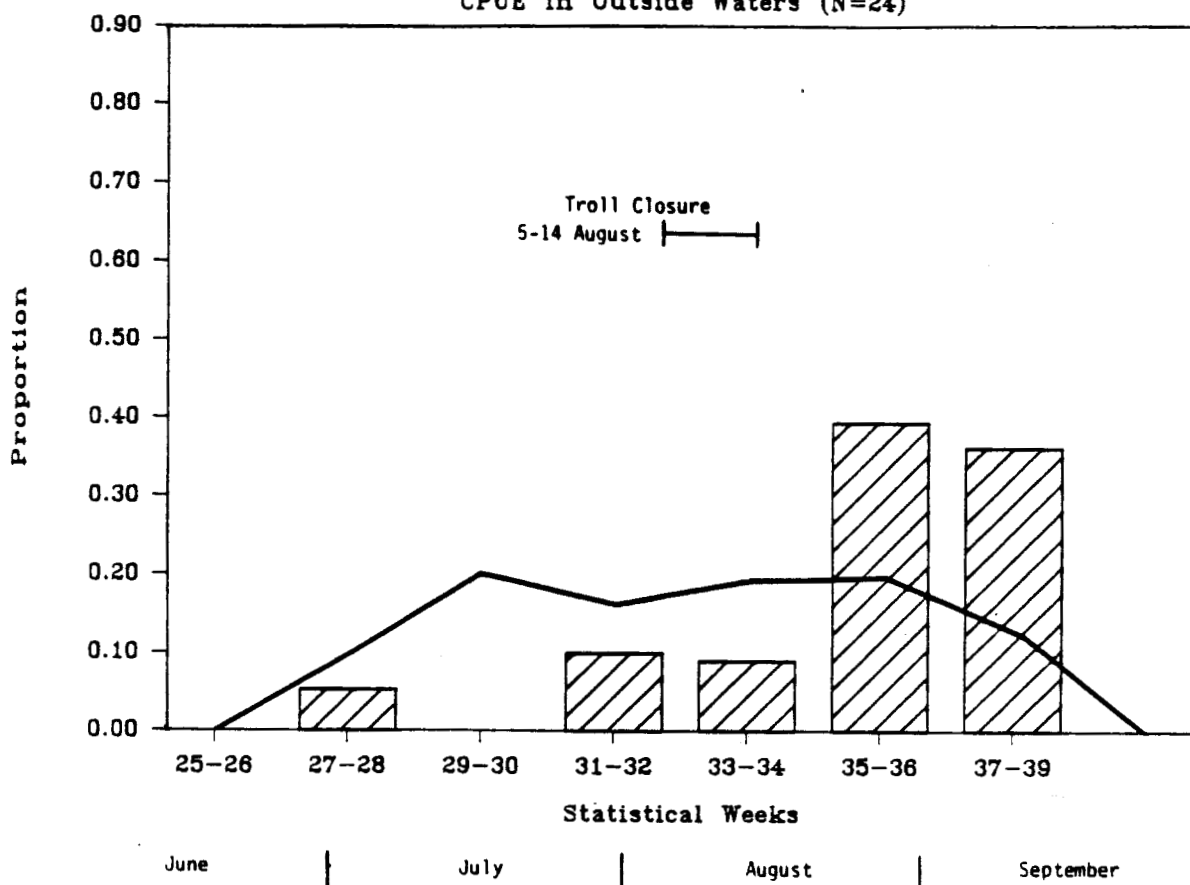
Appendix Figure 12. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Chilkoot Lake coho salmon (bar graph) in outside waters, 1983.



Appendix Figure 13. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Chilkat Lake coho salmon (bar graph) in outside waters, 1983.

# Chilkat Lake Coho Salmon 1983

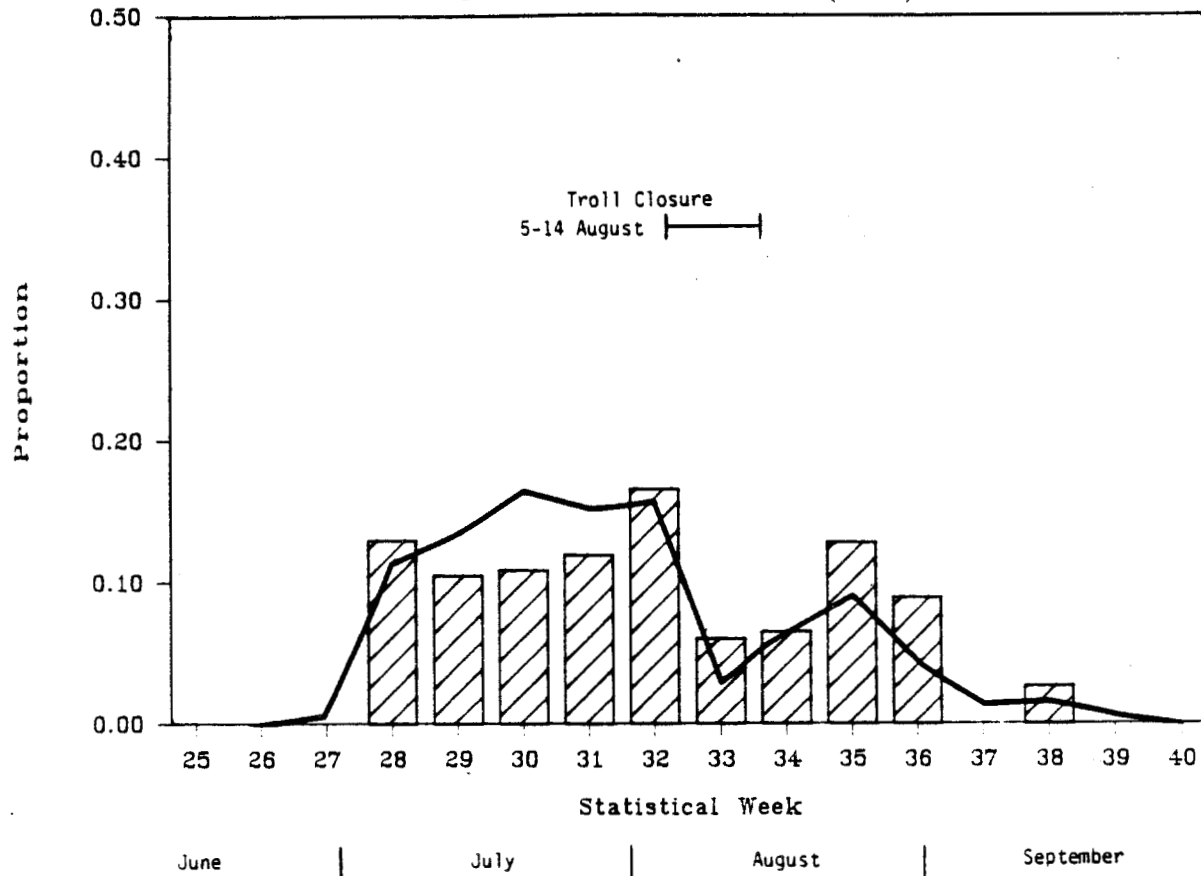
CPUE in Outside Waters (N=24)



Appendix Figure 14. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Chilkat Lake coho salmon (bar graph) in outside waters, 1983.

# Ford Arm Lake Coho Salmon 1983

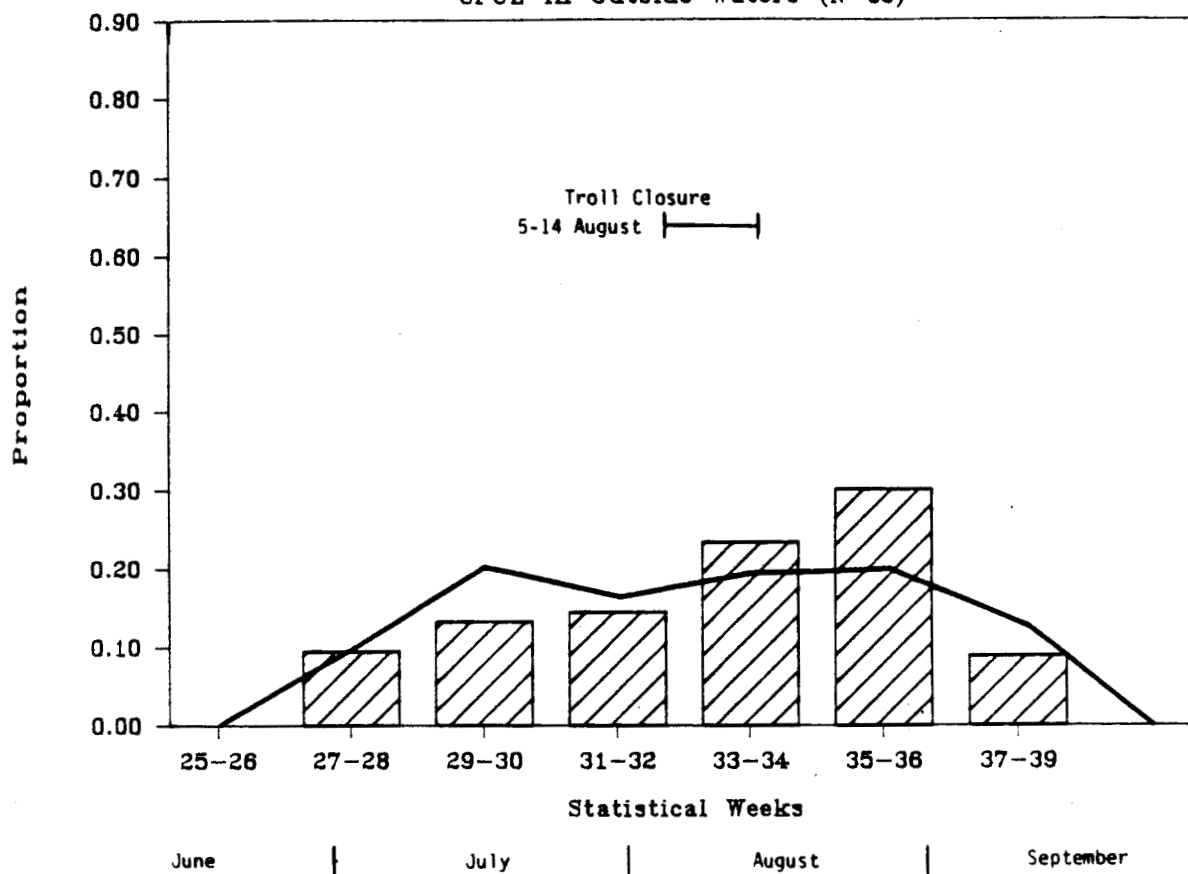
Catch in Outside Waters (N=69)



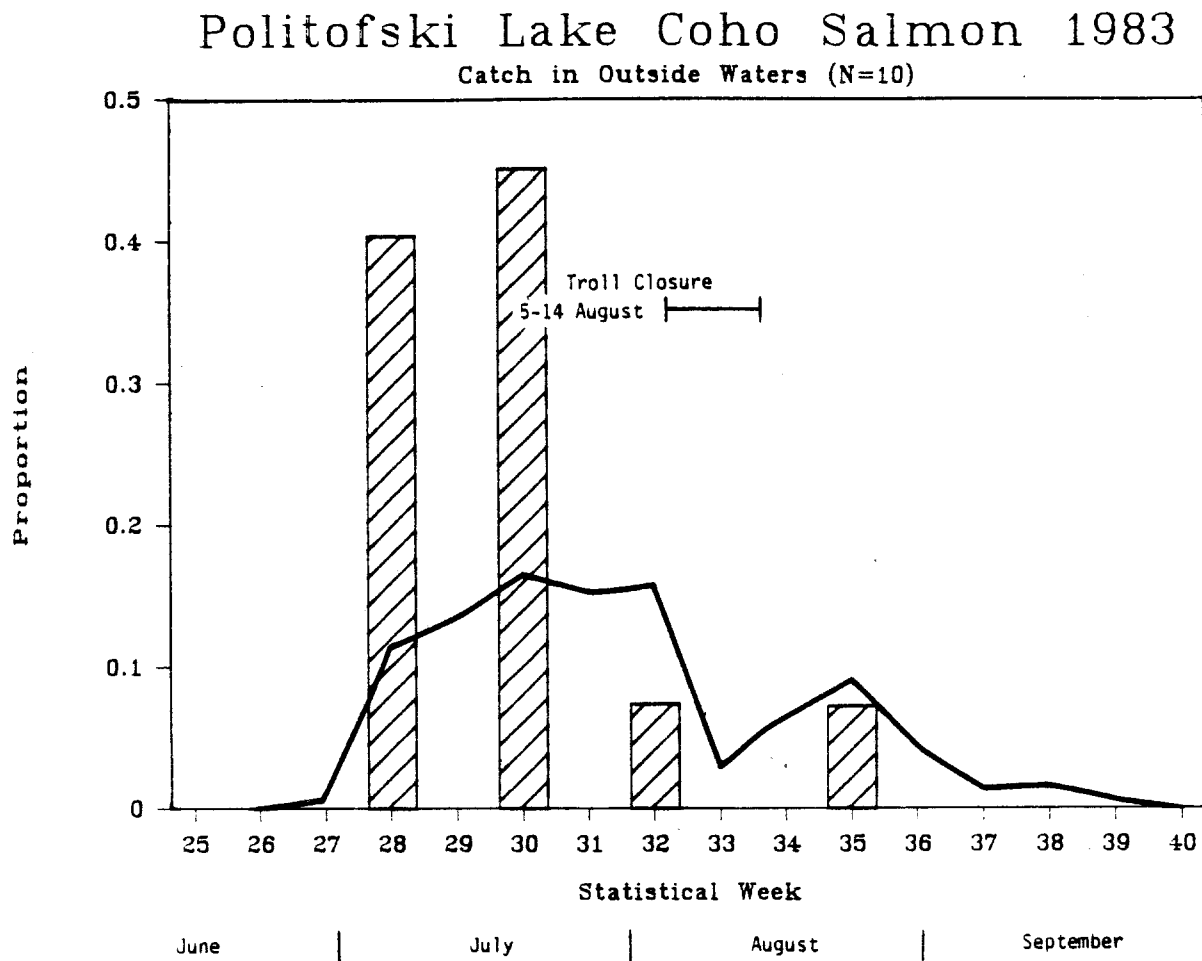
Appendix Figure 15. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Ford Arm Lake coho salmon (bar graph) in outside waters, 1983.

# Ford Arm Lake Coho Salmon 1983

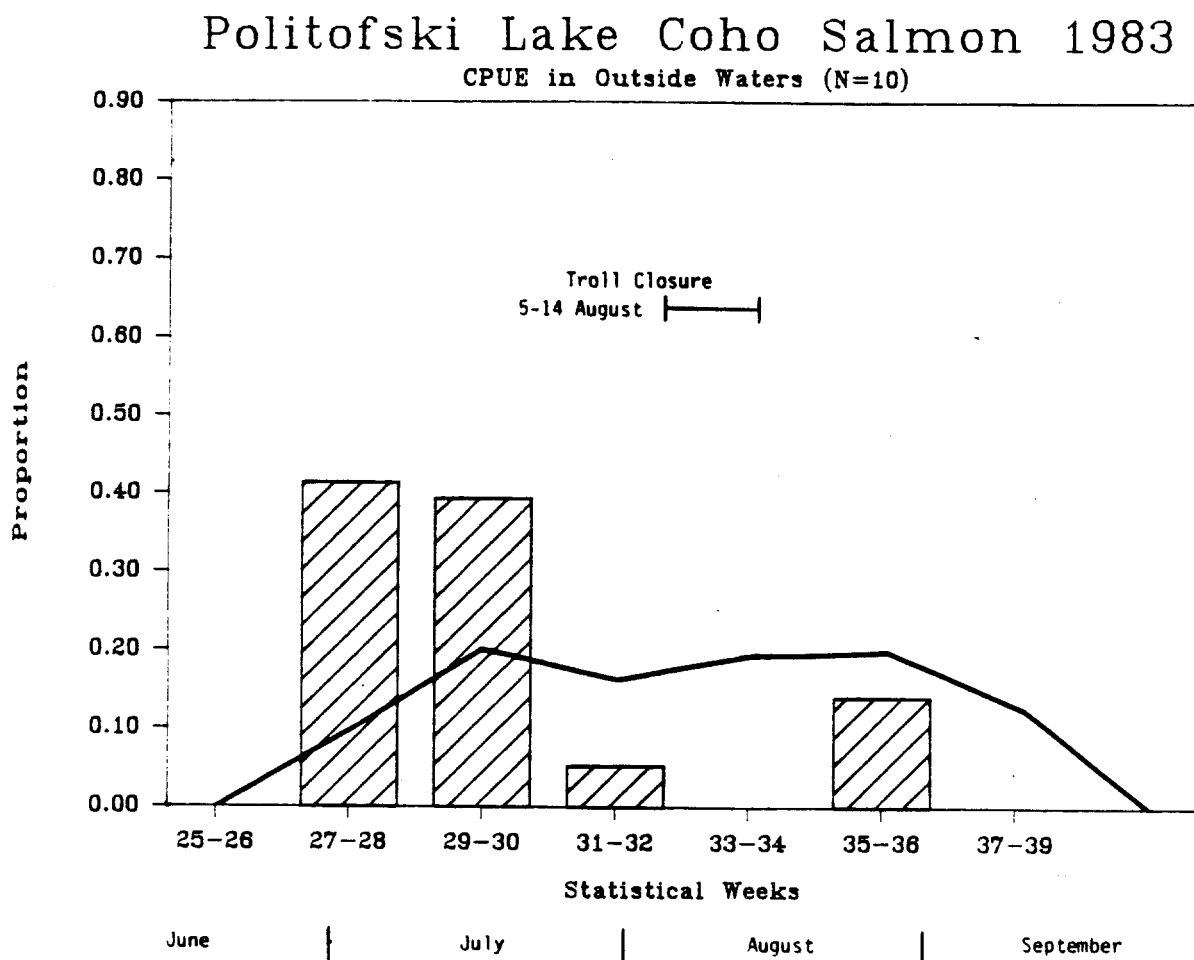
CPUE in Outside Waters (N=69)



Appendix Figure 16. Biweekly proportion of cumulative coho salmon CPUE (line graph) estimated cumulative CPUE of coded-wire tagged Ford Arm Lake coho salmon (bar graph) in outside waters, 1983.

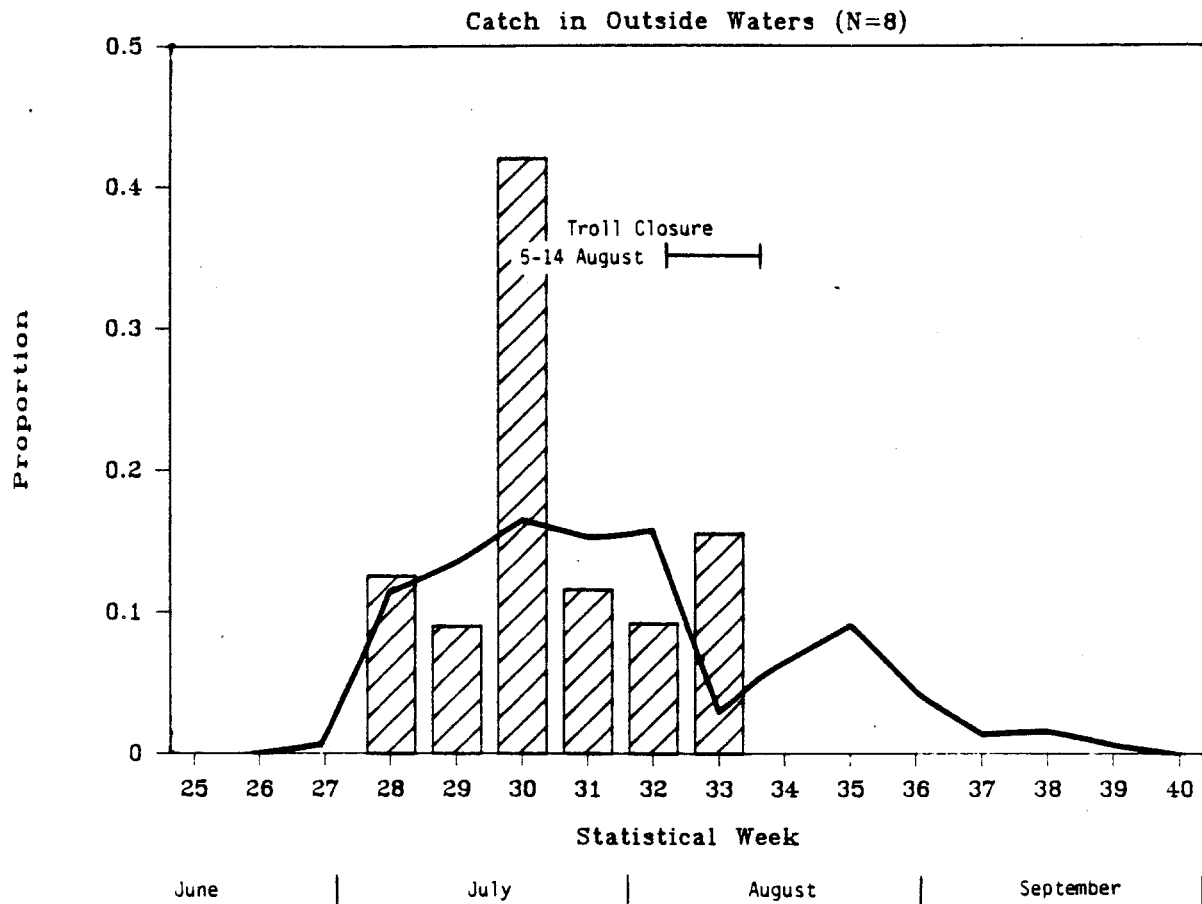


Appendix Figure 17. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Politofski Lake coho salmon (bar graph) in outside waters, 1983.



Appendix Figure 18. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Politofski Lake coho salmon (bar graph) in outside waters, 1983.

# Warm Chuck Lake Coho Salmon 1983

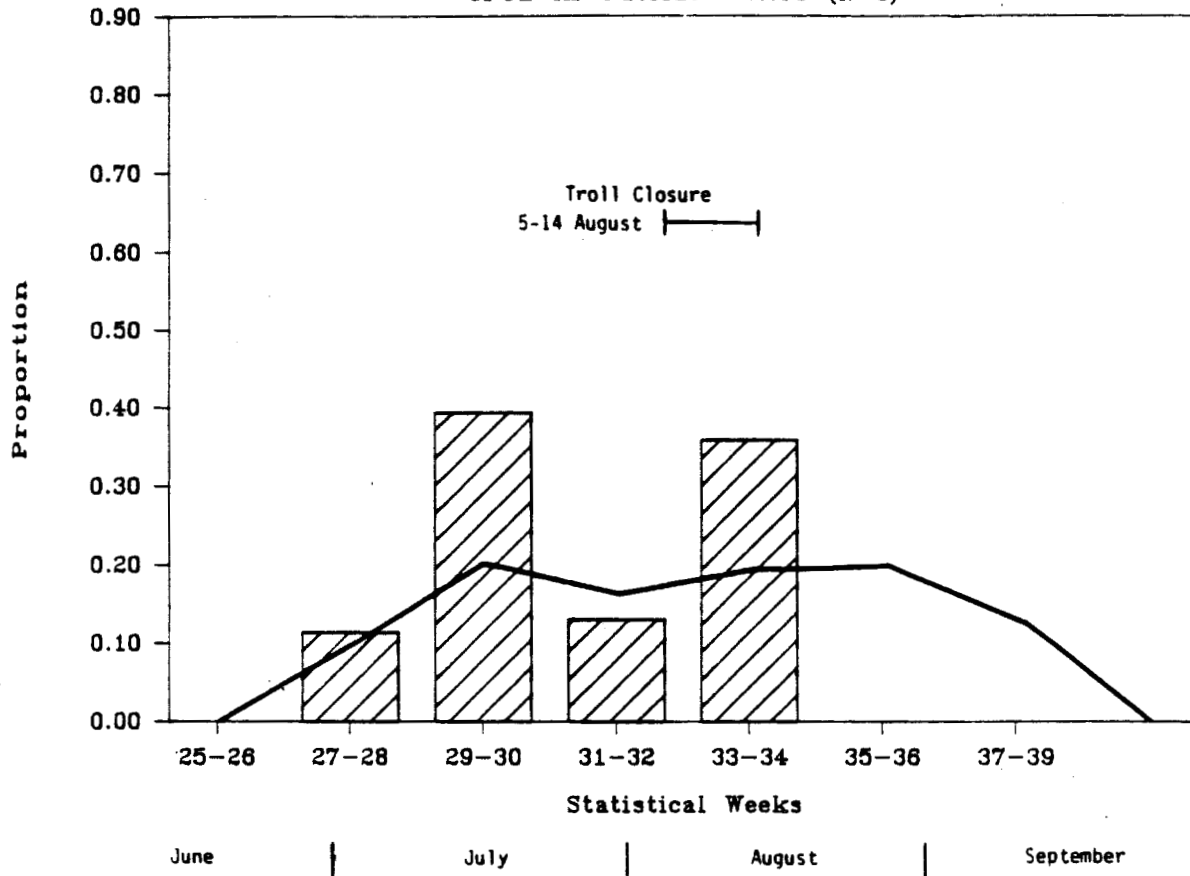


Appendix Figure 19. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Warm Chuck Lake coho salmon (bar graph) in outside waters, 1983.



# Warm Chuck Lake 1983

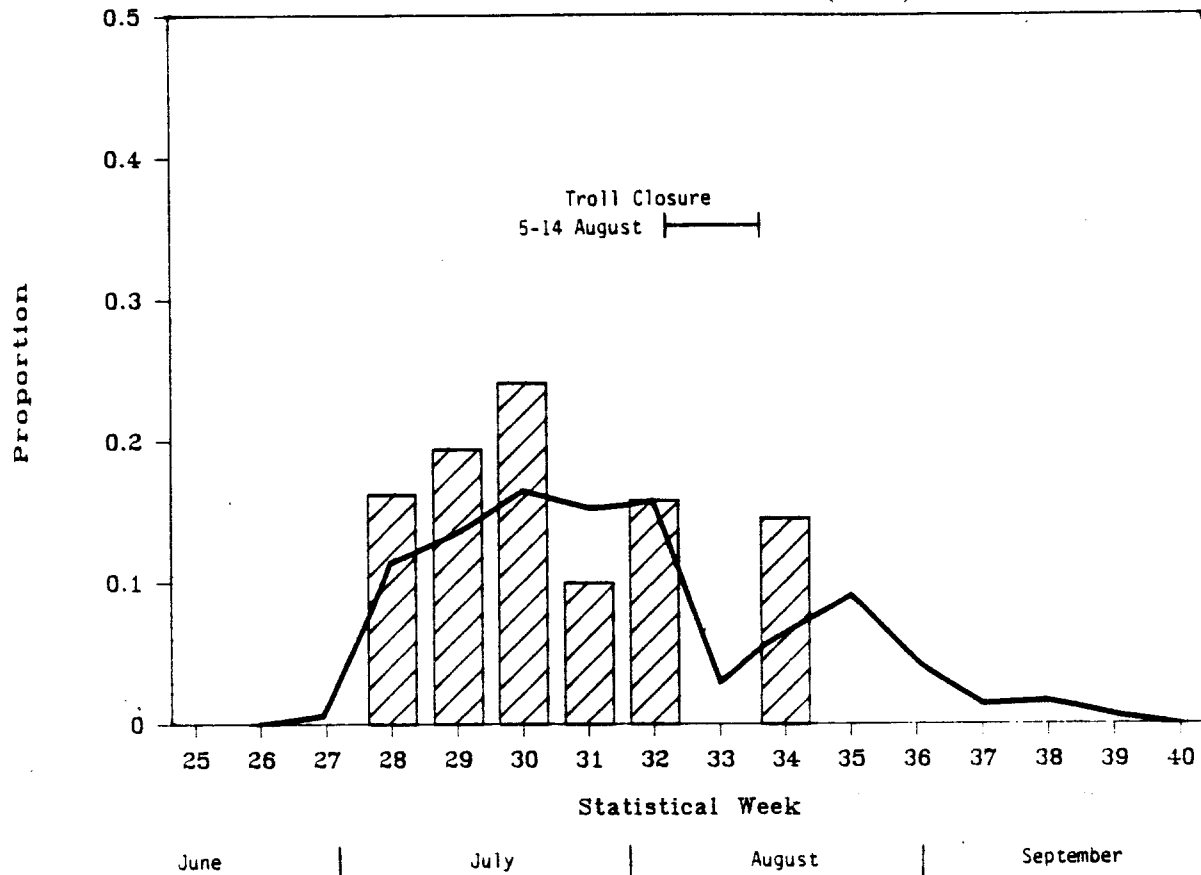
CPUE in Outside Waters (N=8)



Appendix Figure 20. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Warm Chuck Lake coho salmon (bar graph) in outside waters, 1983.

# Klakas Lake Coho Salmon 1983

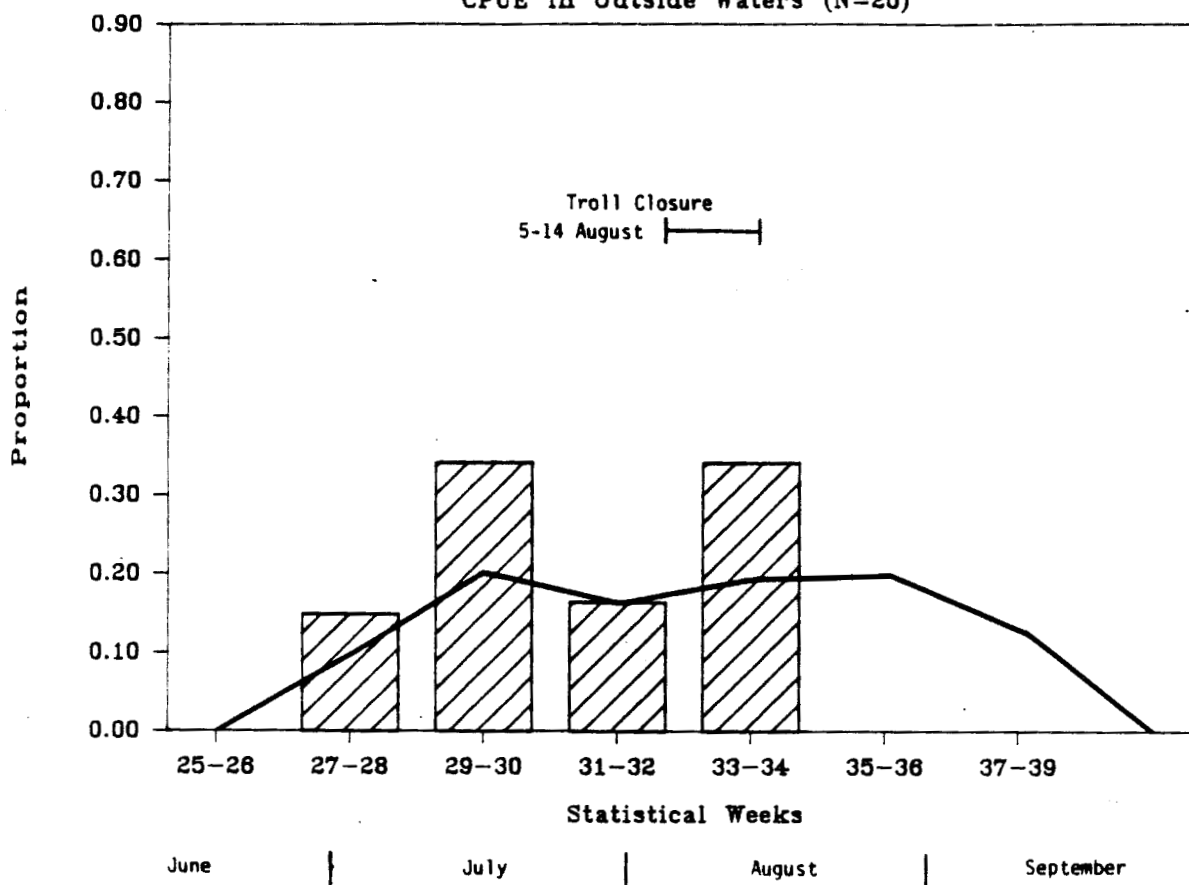
Catch in Outside Waters (N=20)



Appendix Figure 21. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Klakas Lake coho salmon (bar graph) in outside waters, 1983.

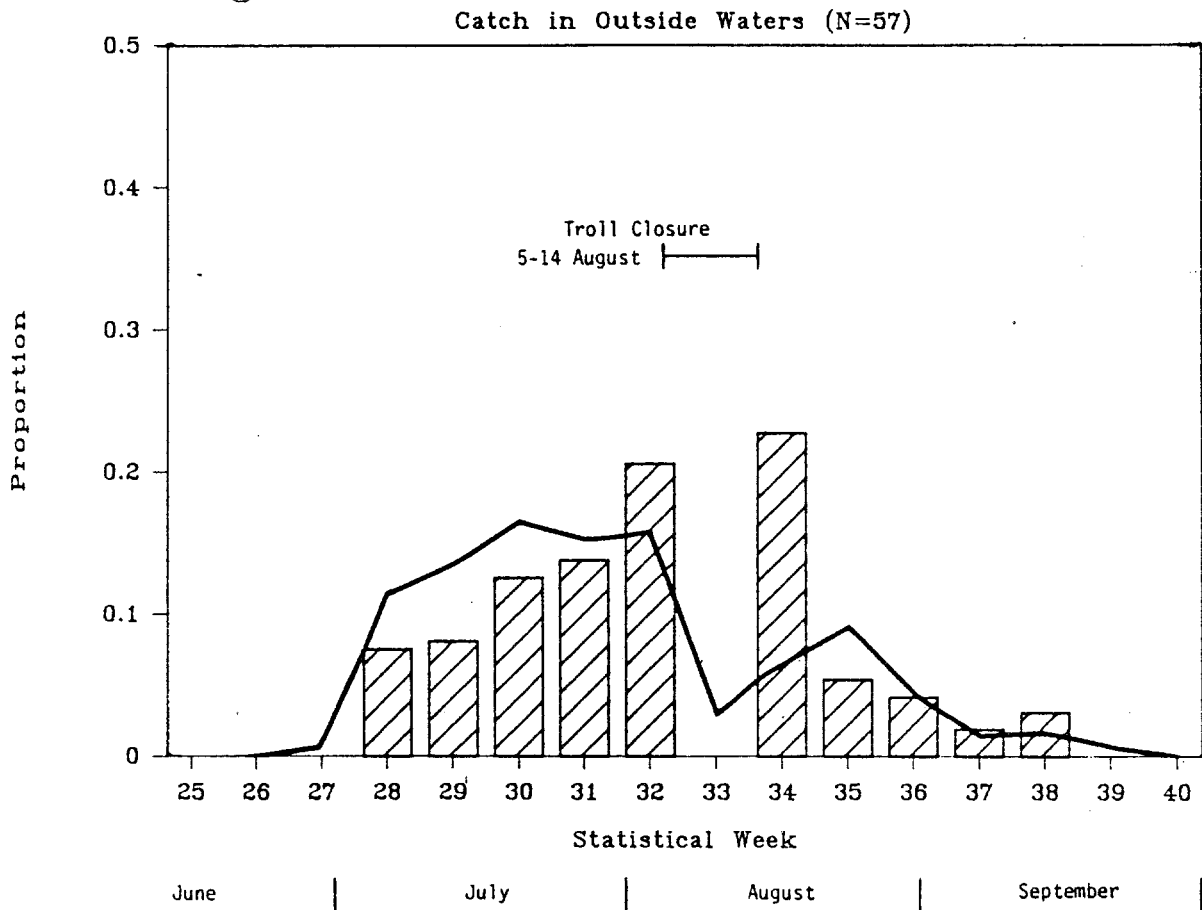
# Klakas Lake Coho Salmon 1983

CPUE in Outside Waters (N=20)



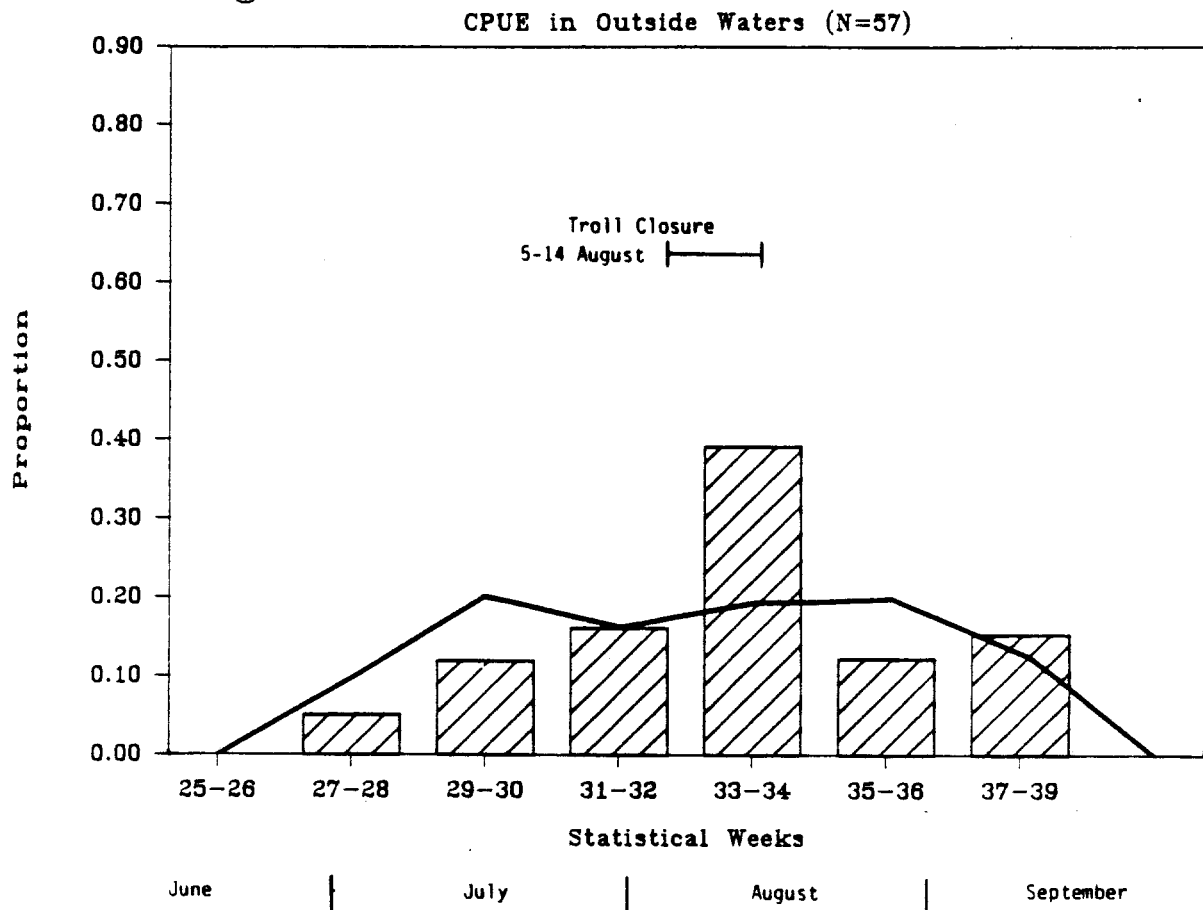
Appendix Figure 22. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Klakas Lake coho salmon (bar graph) in outside waters, 1983.

# Hugh Smith Lake Coho Salmon 1983



Appendix Figure 23. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in outside waters, 1983.

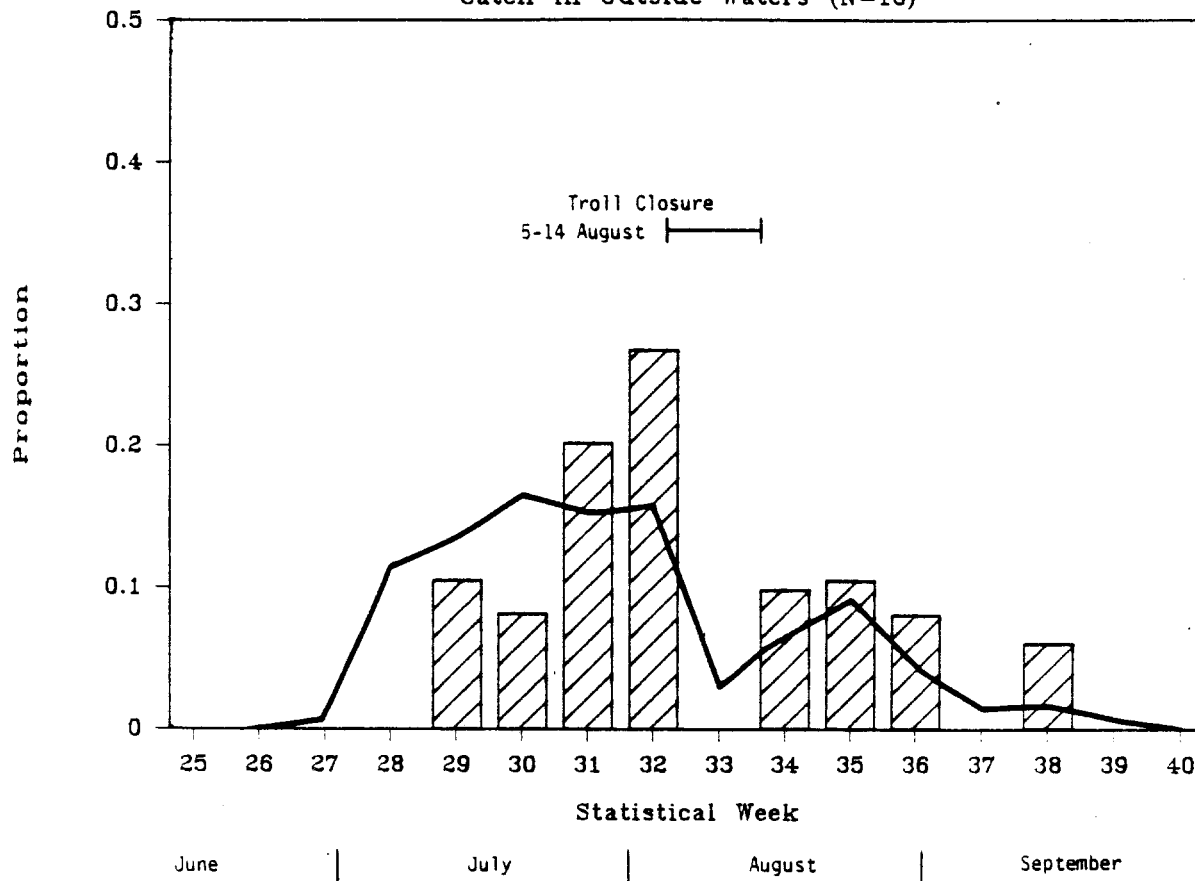
# Hugh Smith Lake Coho Salmon 1983



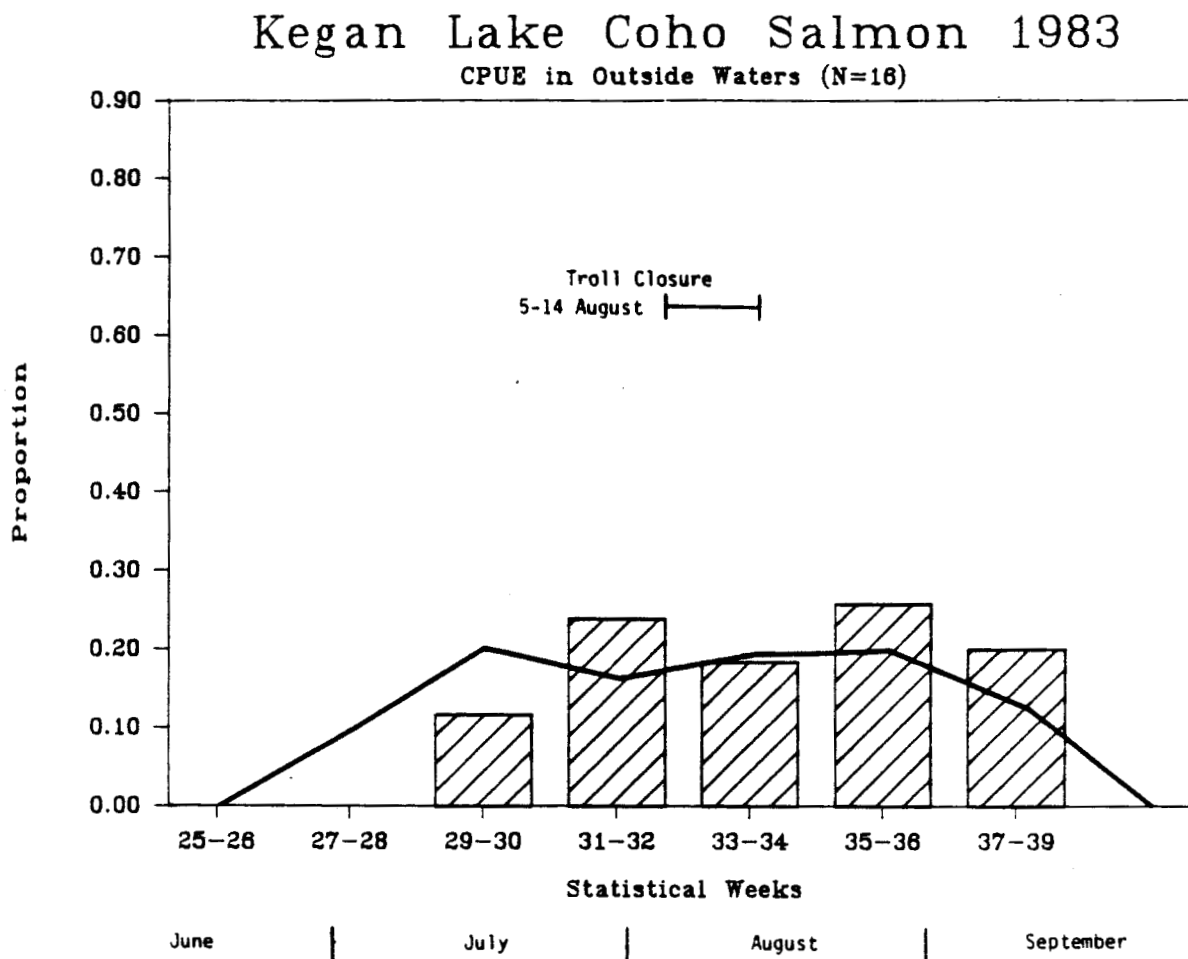
Appendix Figure 24. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in outside waters, 1983.

# Kegan Lake Coho Salmon 1983

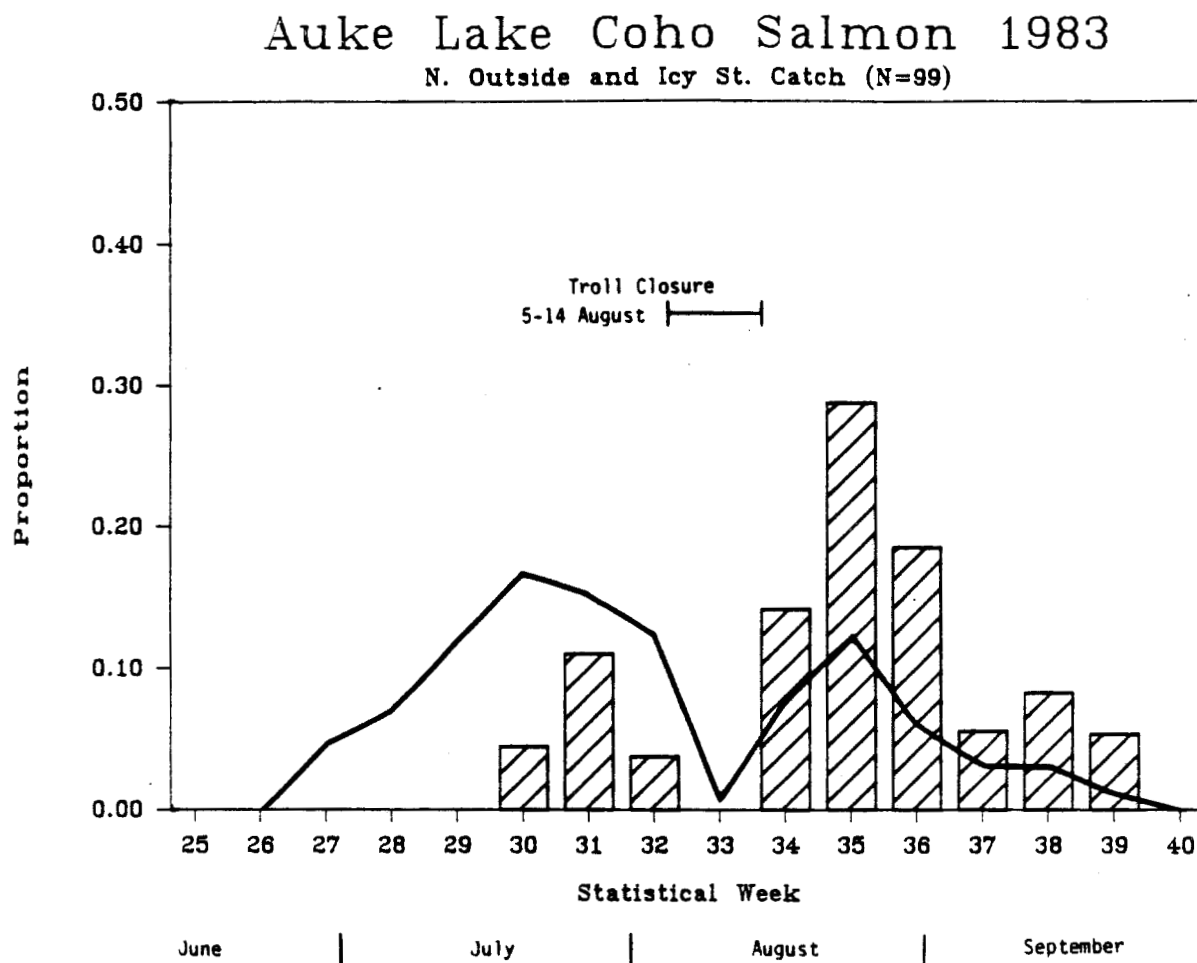
Catch in Outside Waters (N=16)



Appendix Figure 25. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Kegan Lake coho salmon (bar graph) in outside waters, 1983.



Appendix Figure 26. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Kegan Lake coho salmon (bar graph) in outside waters, 1983.

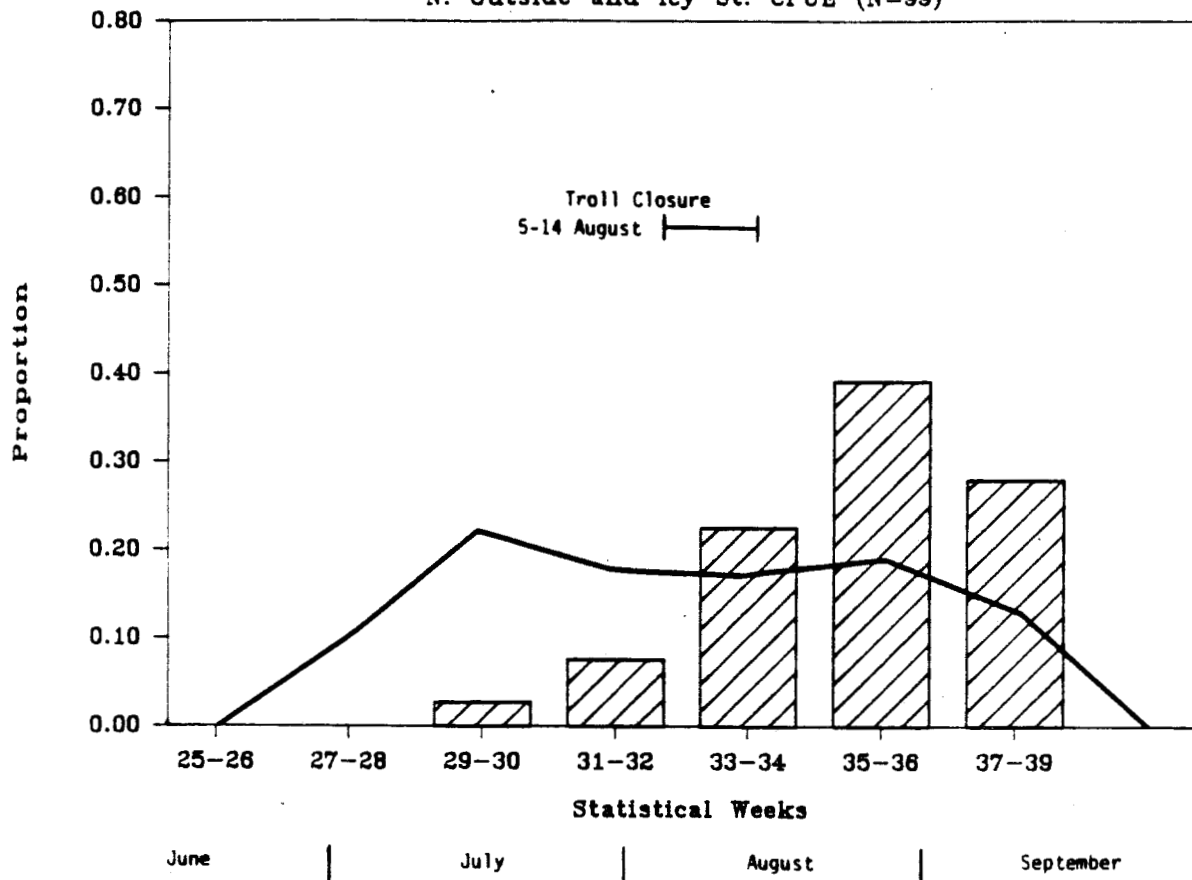


Appendix Figure 27. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Auke Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.



# Auke Lake Coho Salmon 1983

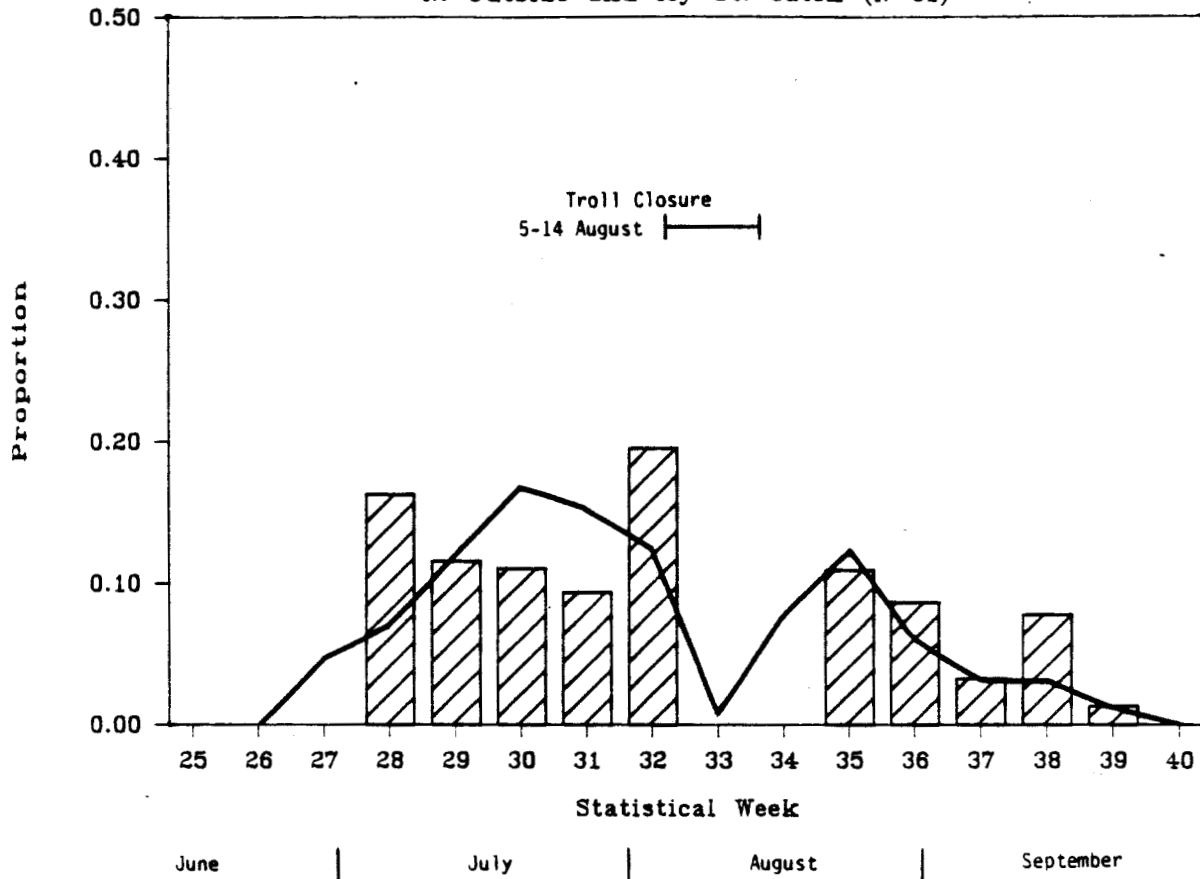
N. Outside and Icy St. CPUE (N=99)



Appendix Figure 28. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Auke Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Speel Lake Coho Salmon 1983

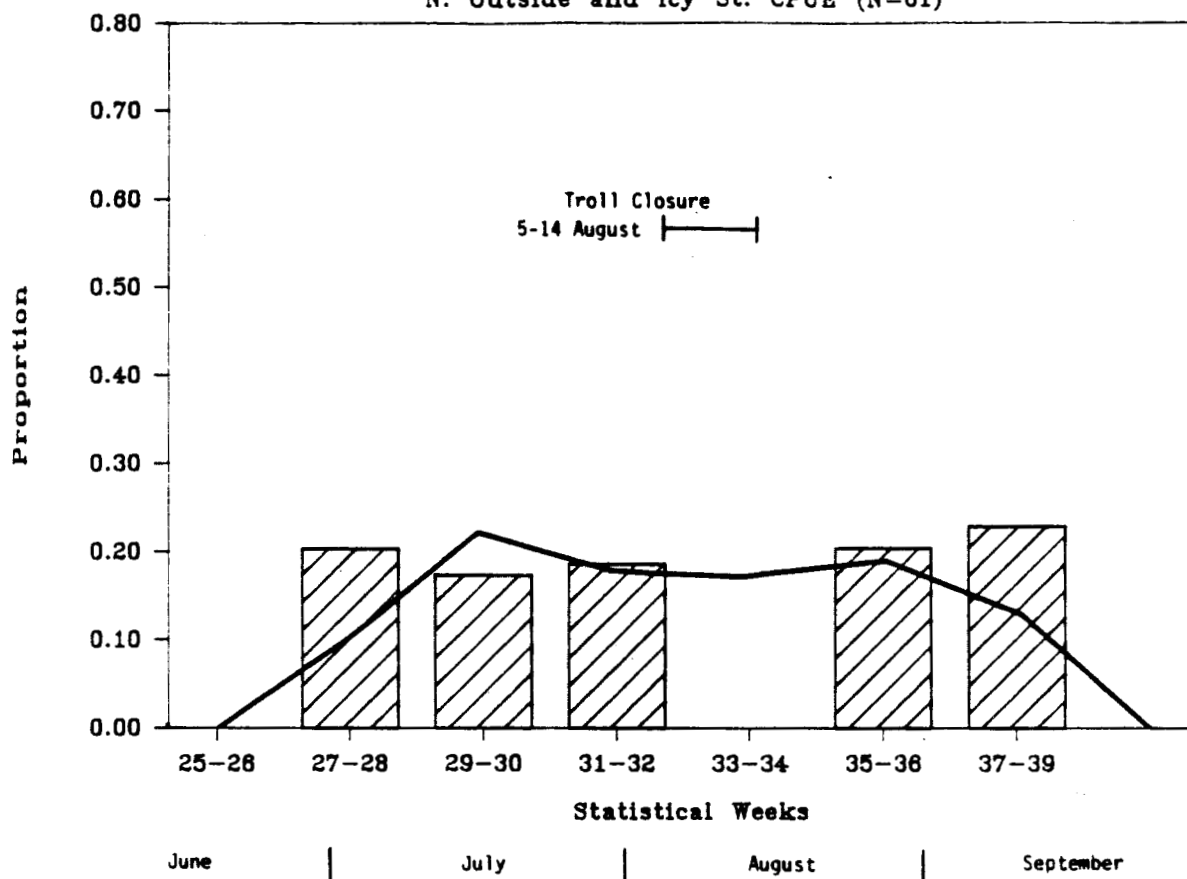
N. Outside and Icy St. Catch (N=61)



Appendix Figure 29. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Speel Lake coho salmon (bar graph) Icy Strait and outside waters north of Helm Point, 1983.

# Speel Lake Coho Salmon 1983

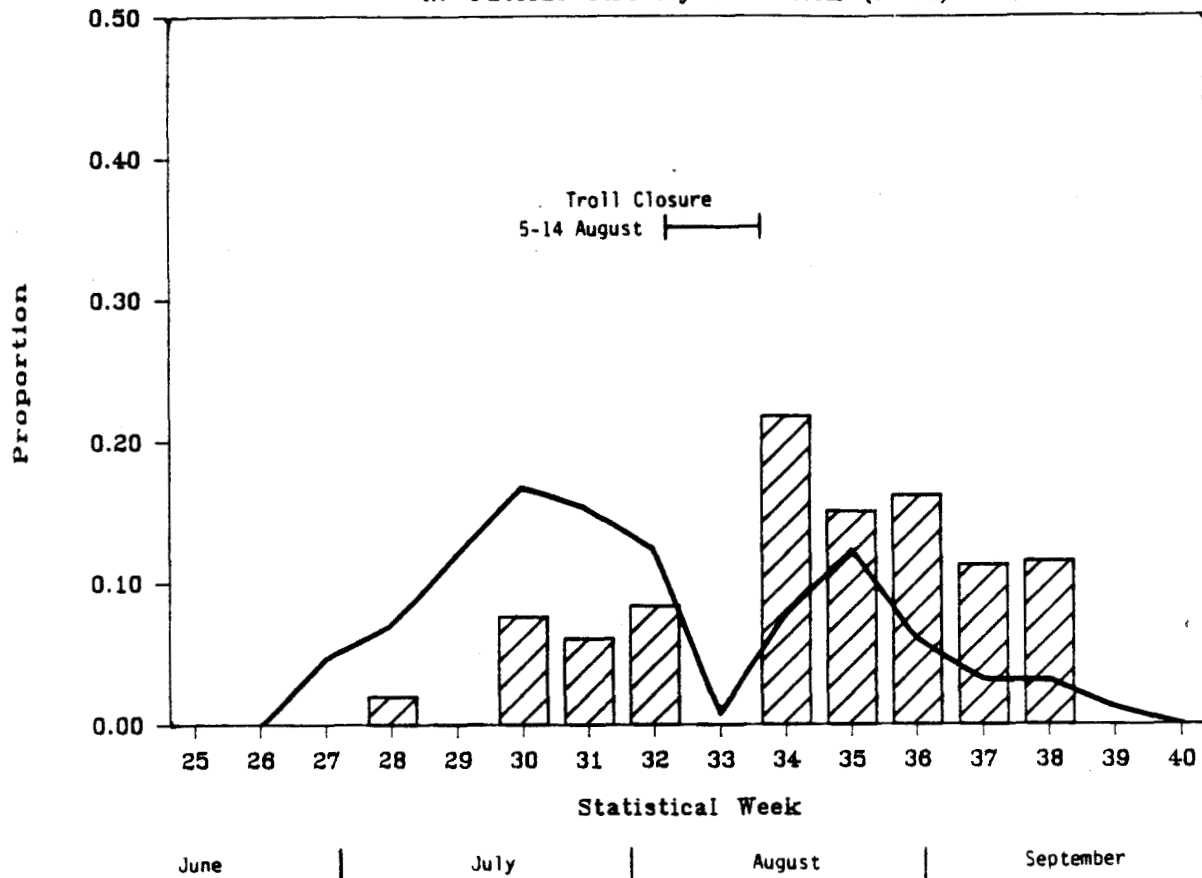
N. Outside and Icy St. CPUE (N=61)



Appendix Figure 30. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Speel Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Berners River Coho Salmon 1983

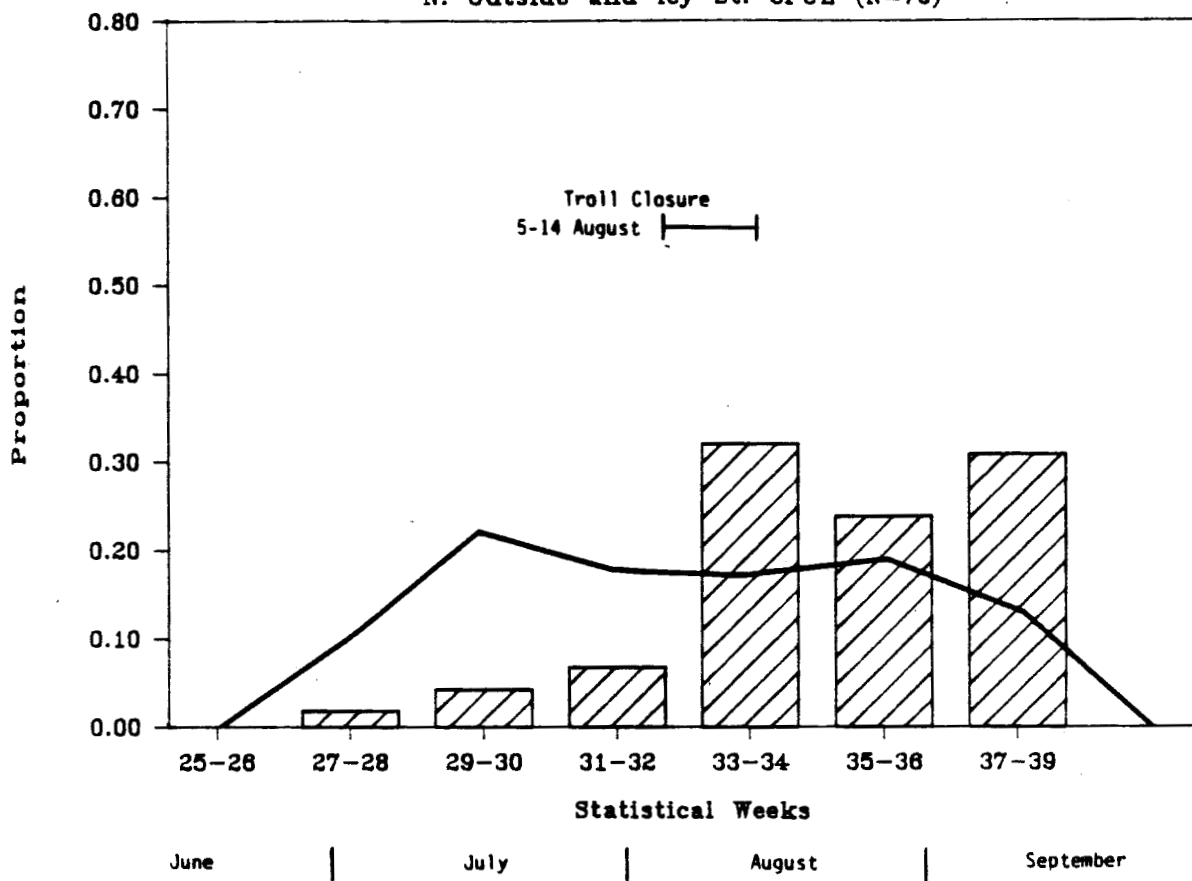
N. Outside and Icy St. Catch (N=70)



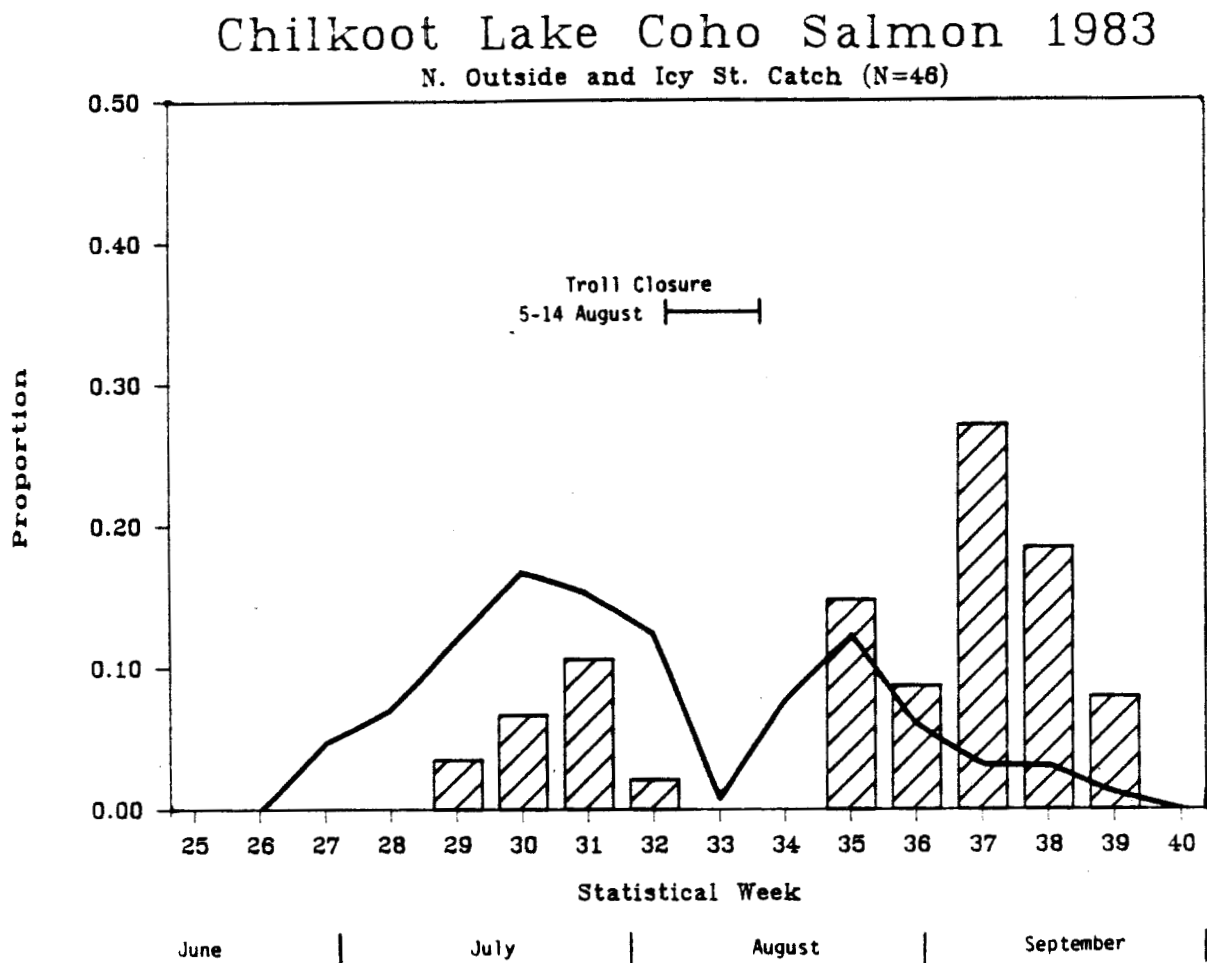
Appendix Figure 31. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Berners River coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Berners River Coho Salmon 1983

N. Outside and Icy St. CPUE (N=70)



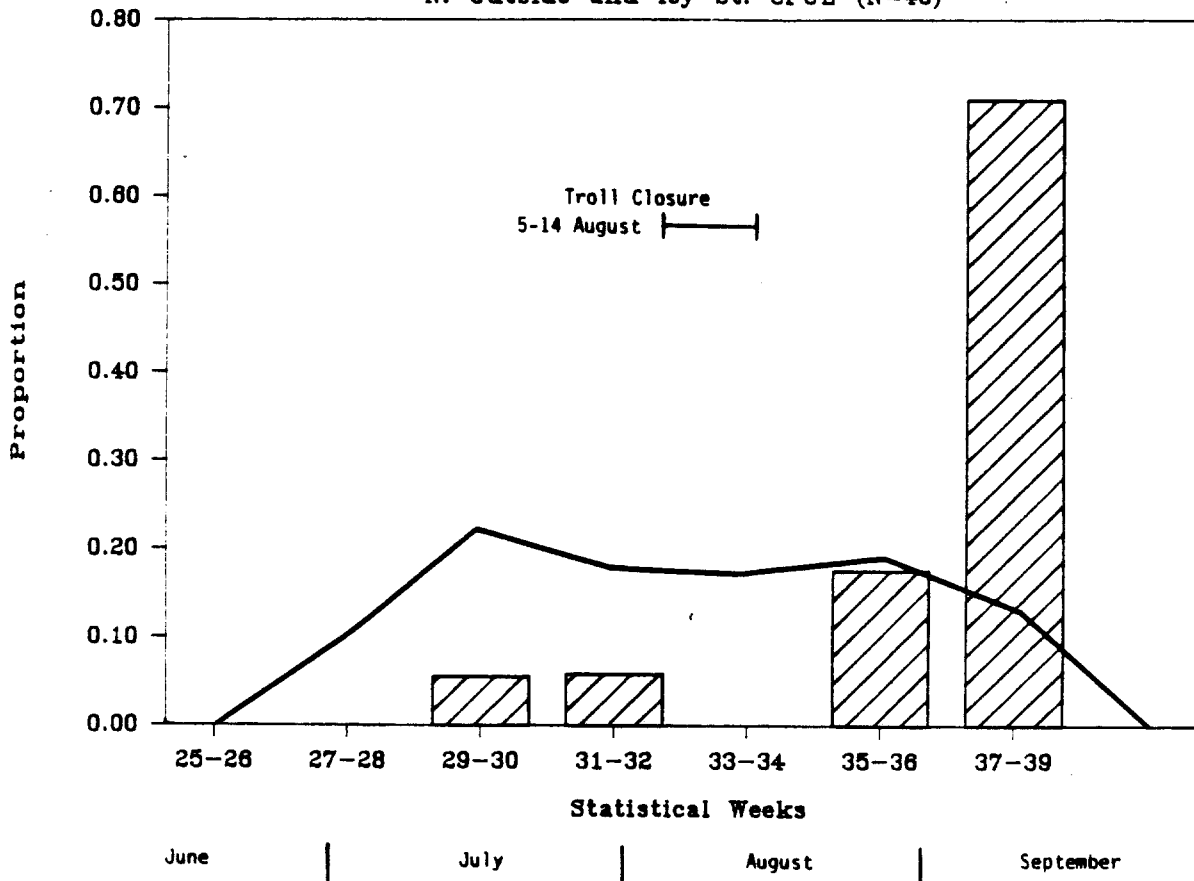
Appendix Figure 32. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Berners River coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.



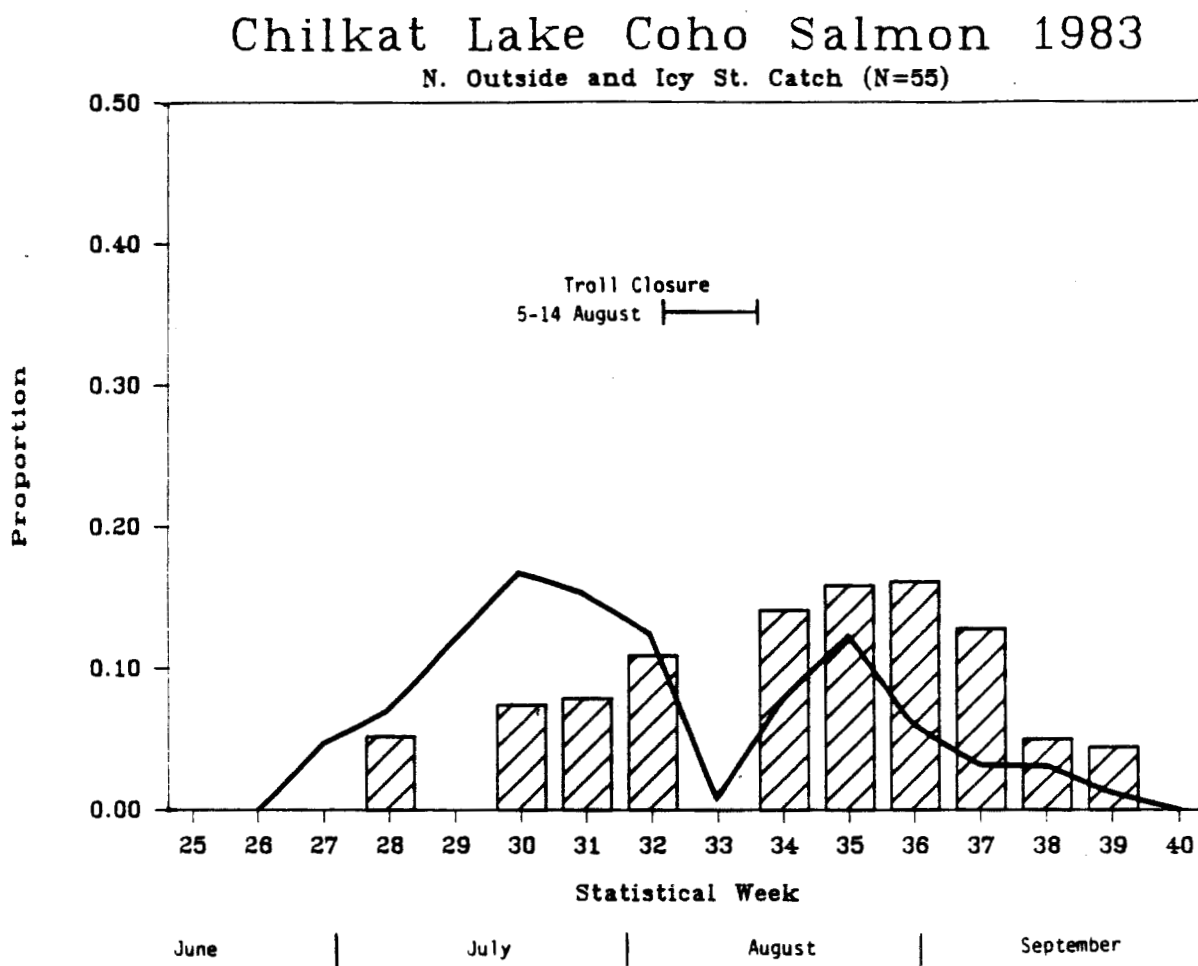
Appendix Figure 33. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Chilkoot Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Chilkoot Lake Coho Salmon 1983

N. Outside and Icy St. CPUE (N=46)



Appendix Figure 34. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Chilkoot Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

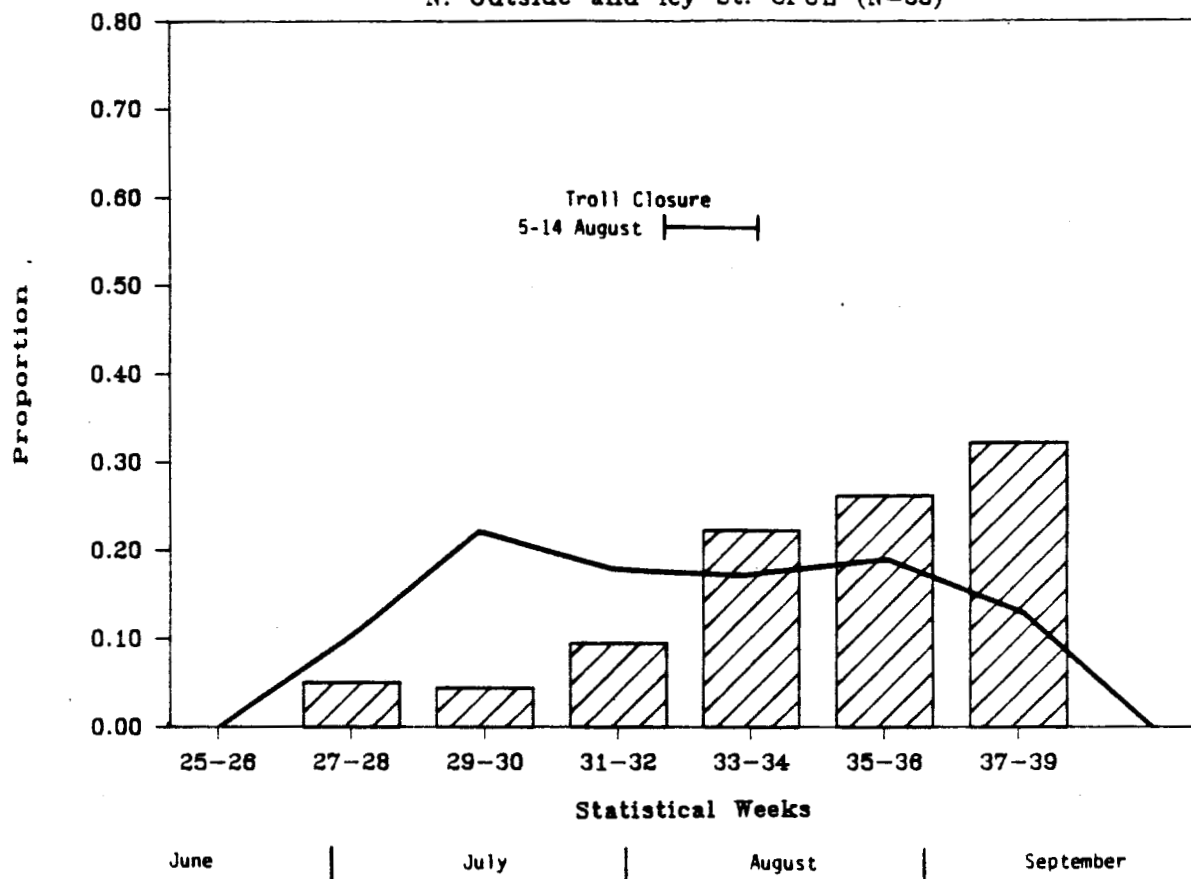


Appendix Figure 35. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Chilkat Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.



# Chilkat Lake Coho Salmon 1983

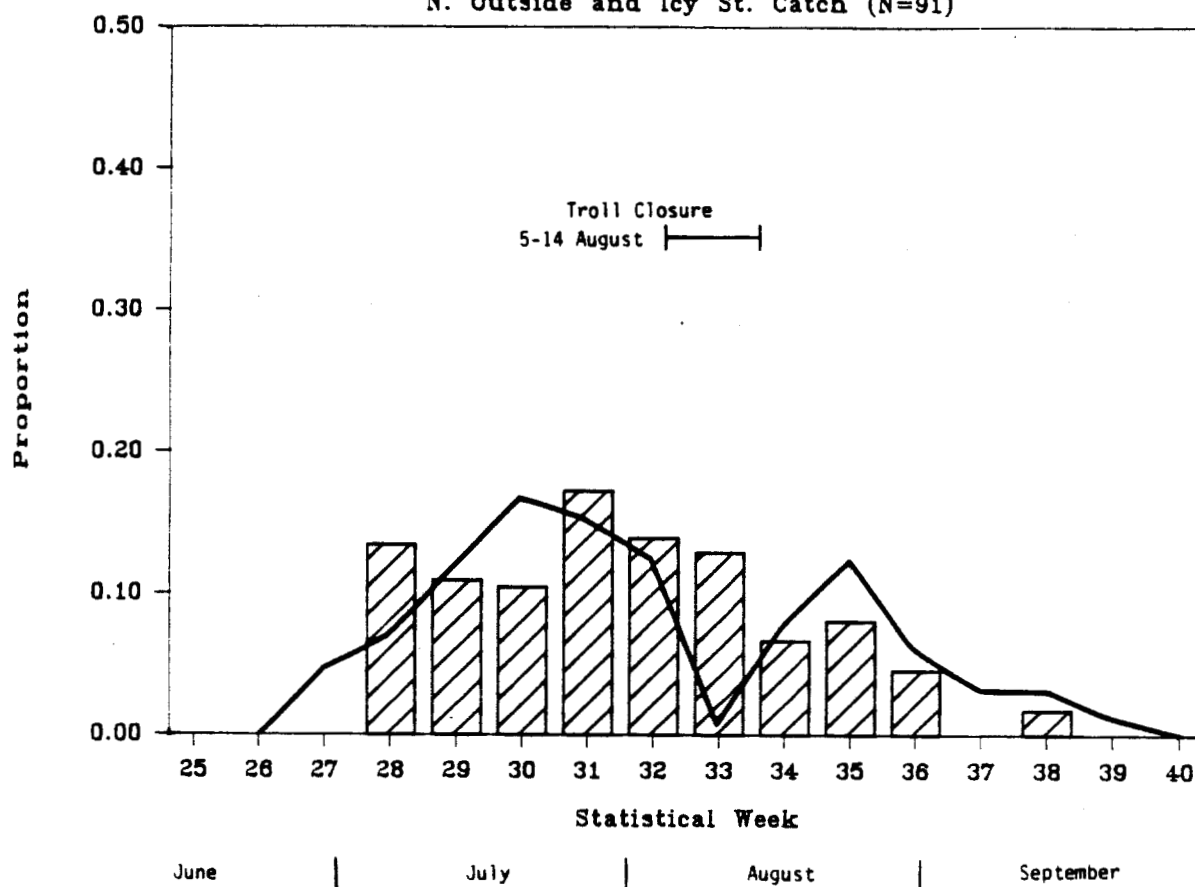
N. Outside and Icy St. CPUE (N=55)



Appendix Figure 36. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Chilkat Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Ford Lake Coho Salmon 1983

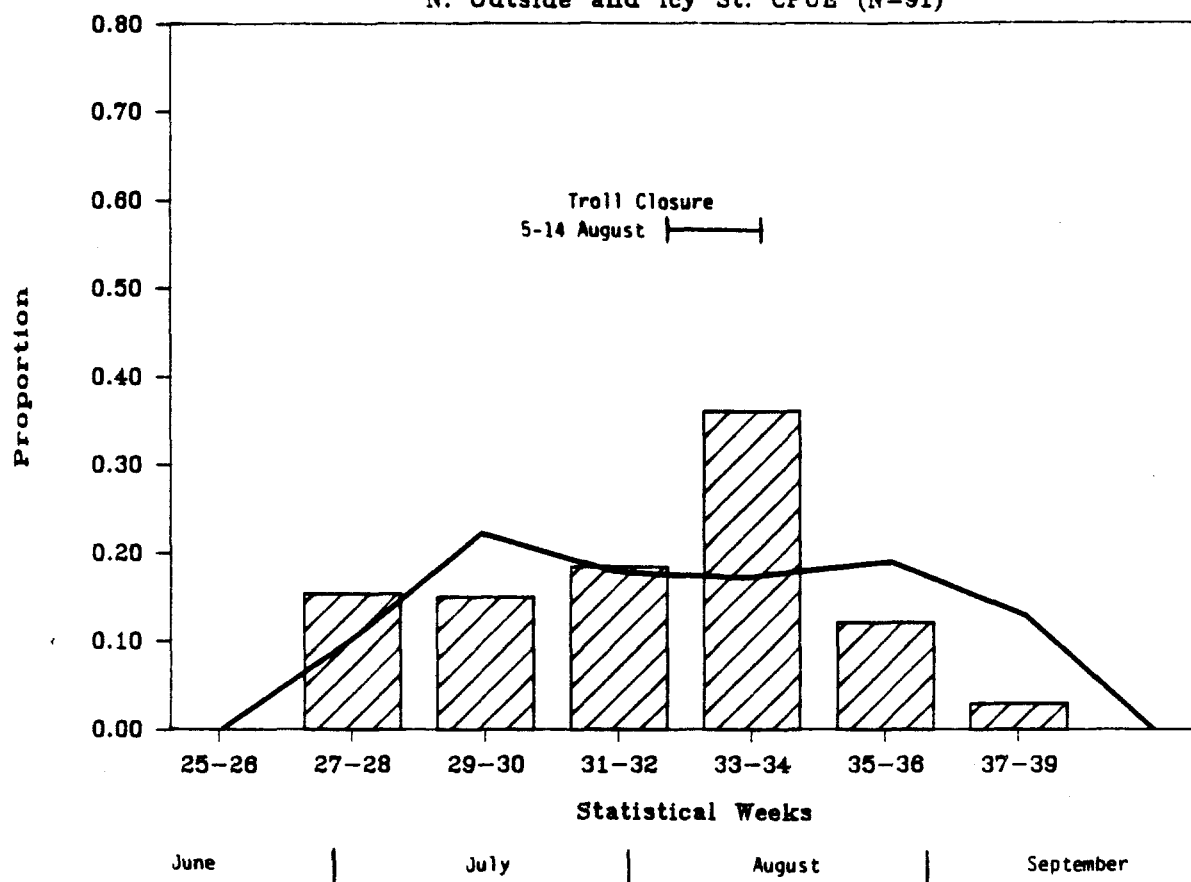
N. Outside and Icy St. Catch (N=91)



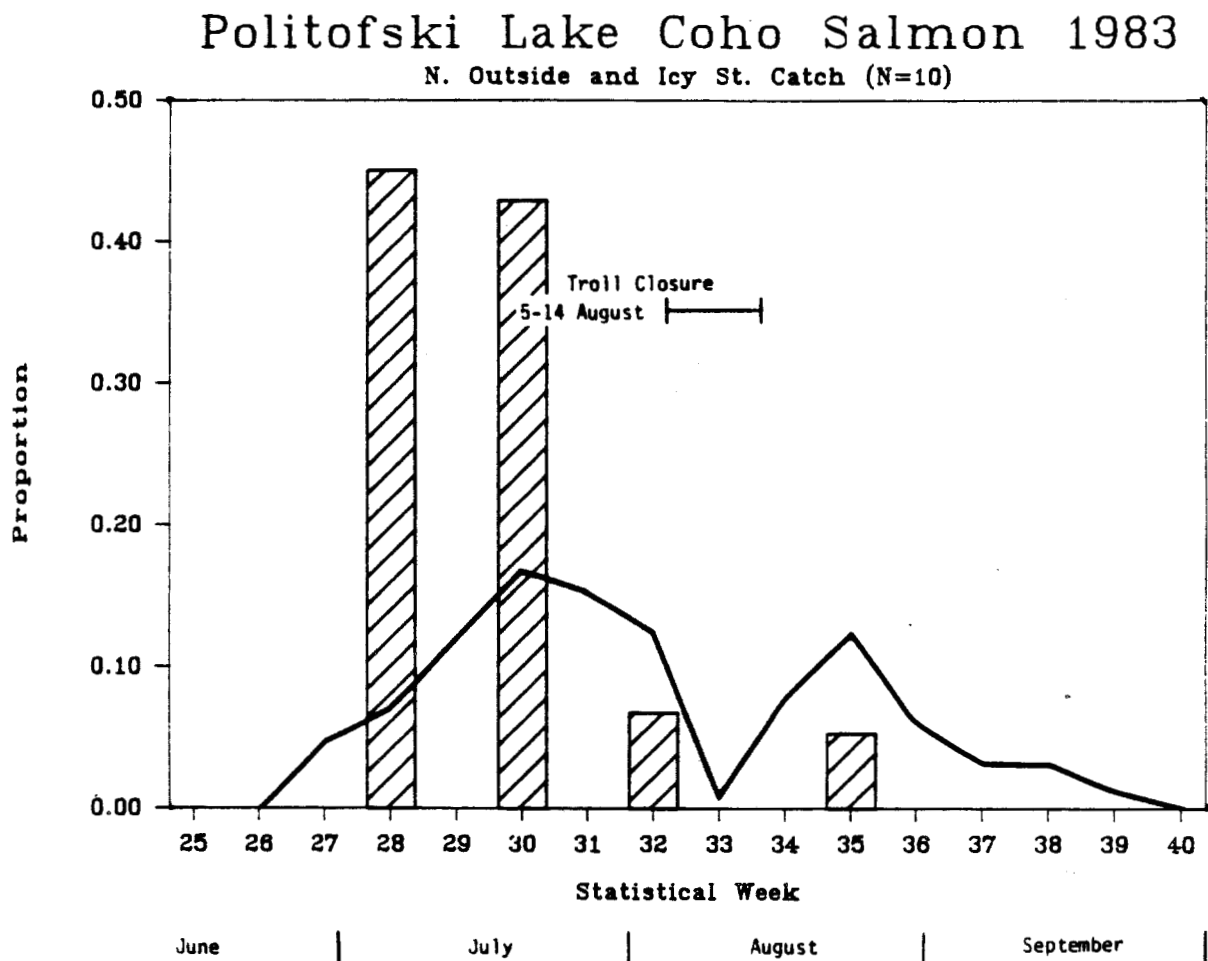
Appendix Figure 37. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Ford Arm Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Ford Arm Lake Coho Salmon 1983

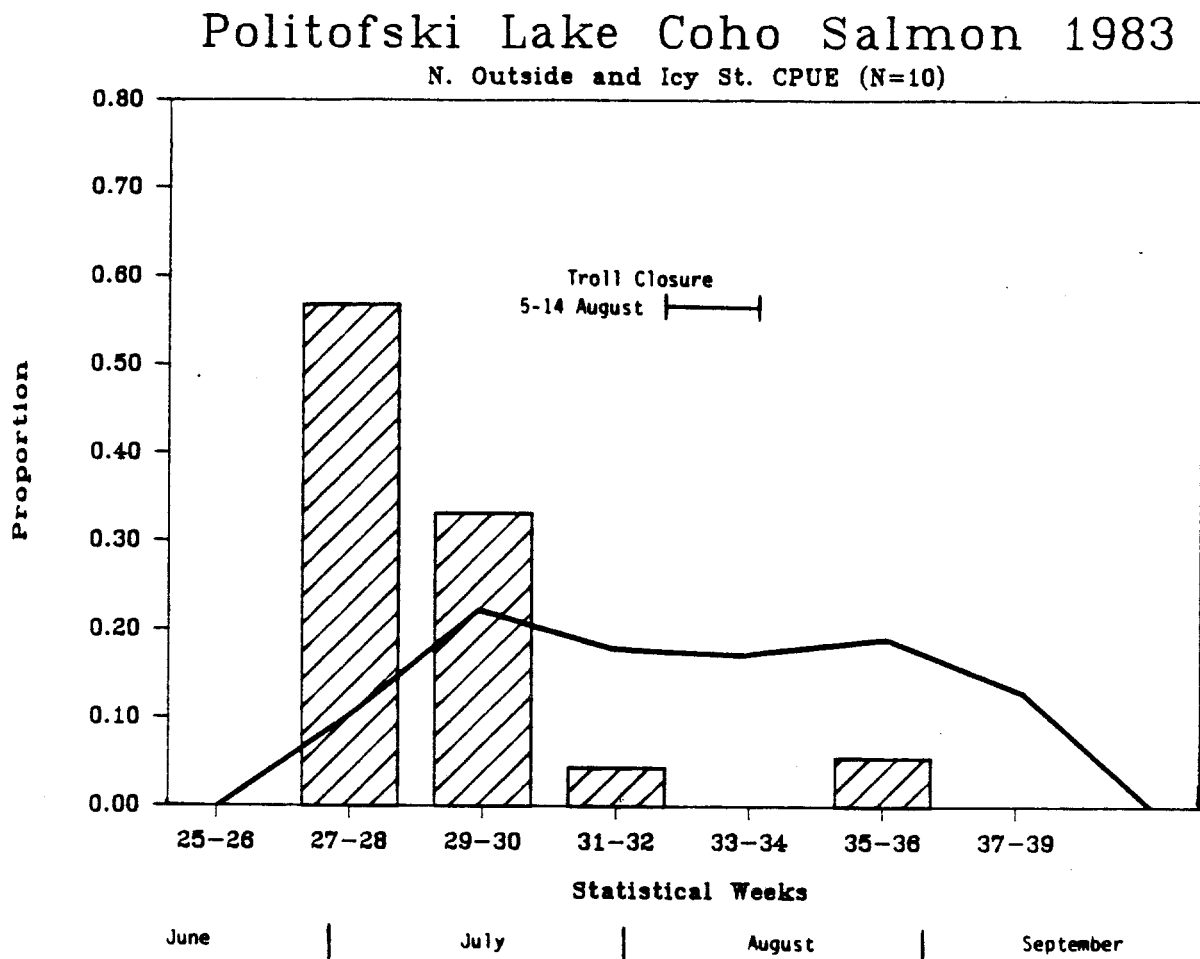
N. Outside and Icy St. CPUE (N=91)



Appendix Figure 38. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Ford Arm Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.



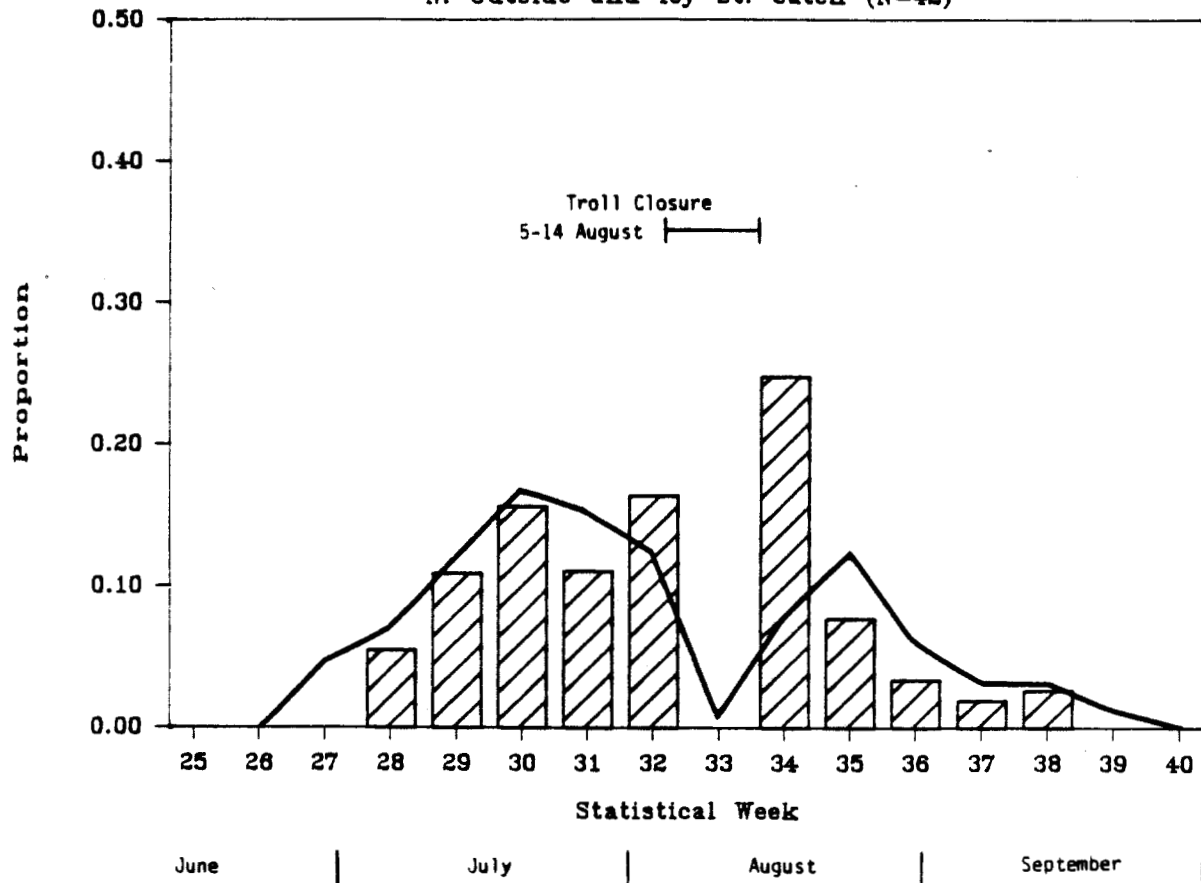
Appendix Figure 39. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Politofski Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.



Appendix Figure 40. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Politofski Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Hugh Smith Lake Coho Salmon 1983

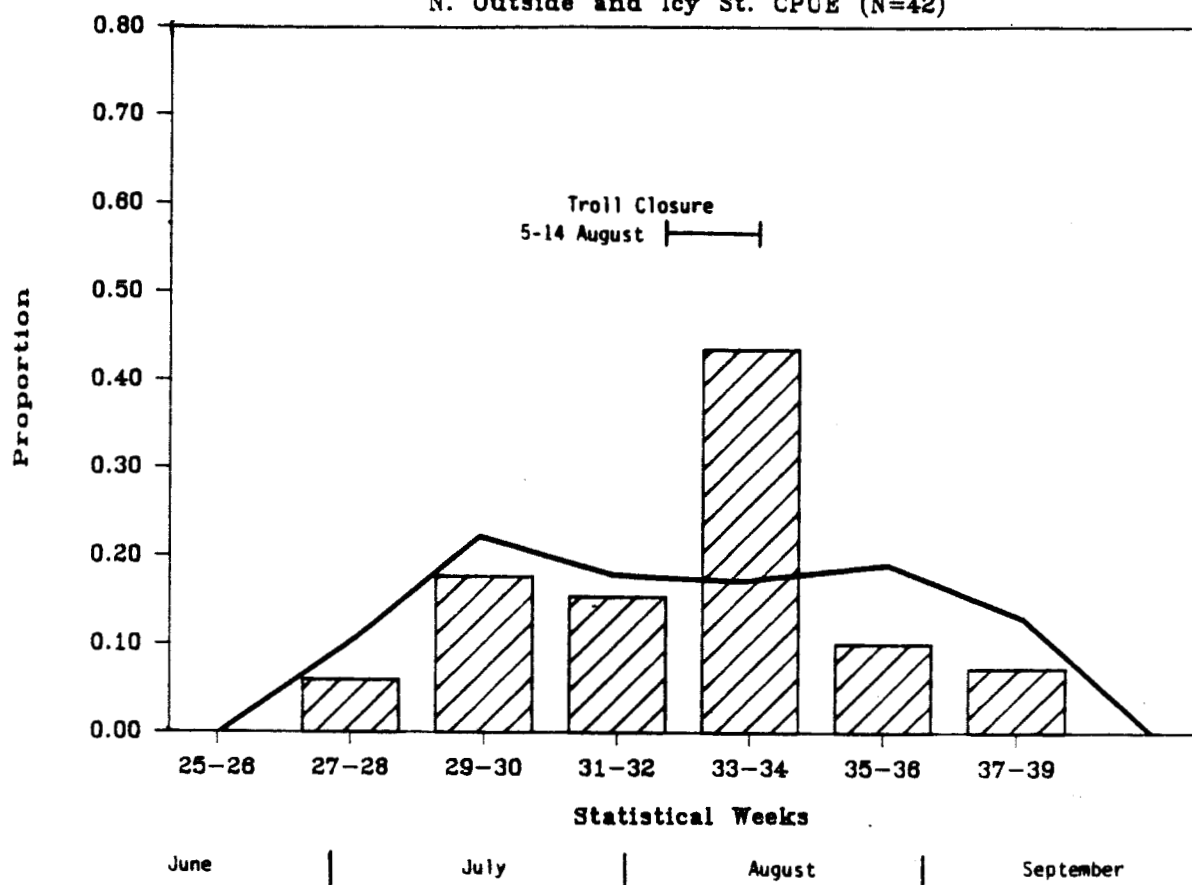
N. Outside and Icy St. Catch (N=42)



Appendix Figure 41. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Hugh Smith Lake Coho Salmon 1983

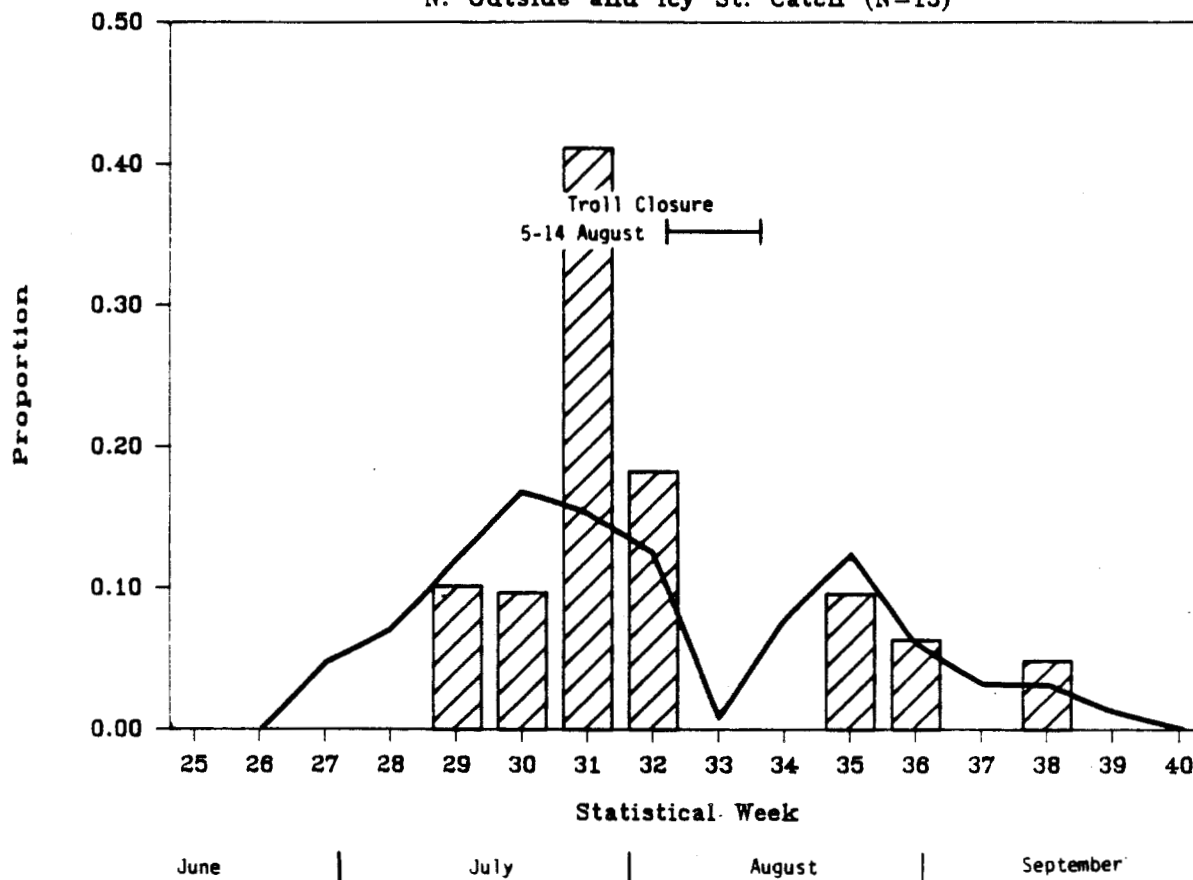
N. Outside and Icy St. CPUE (N=42)



Appendix Figure 42. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

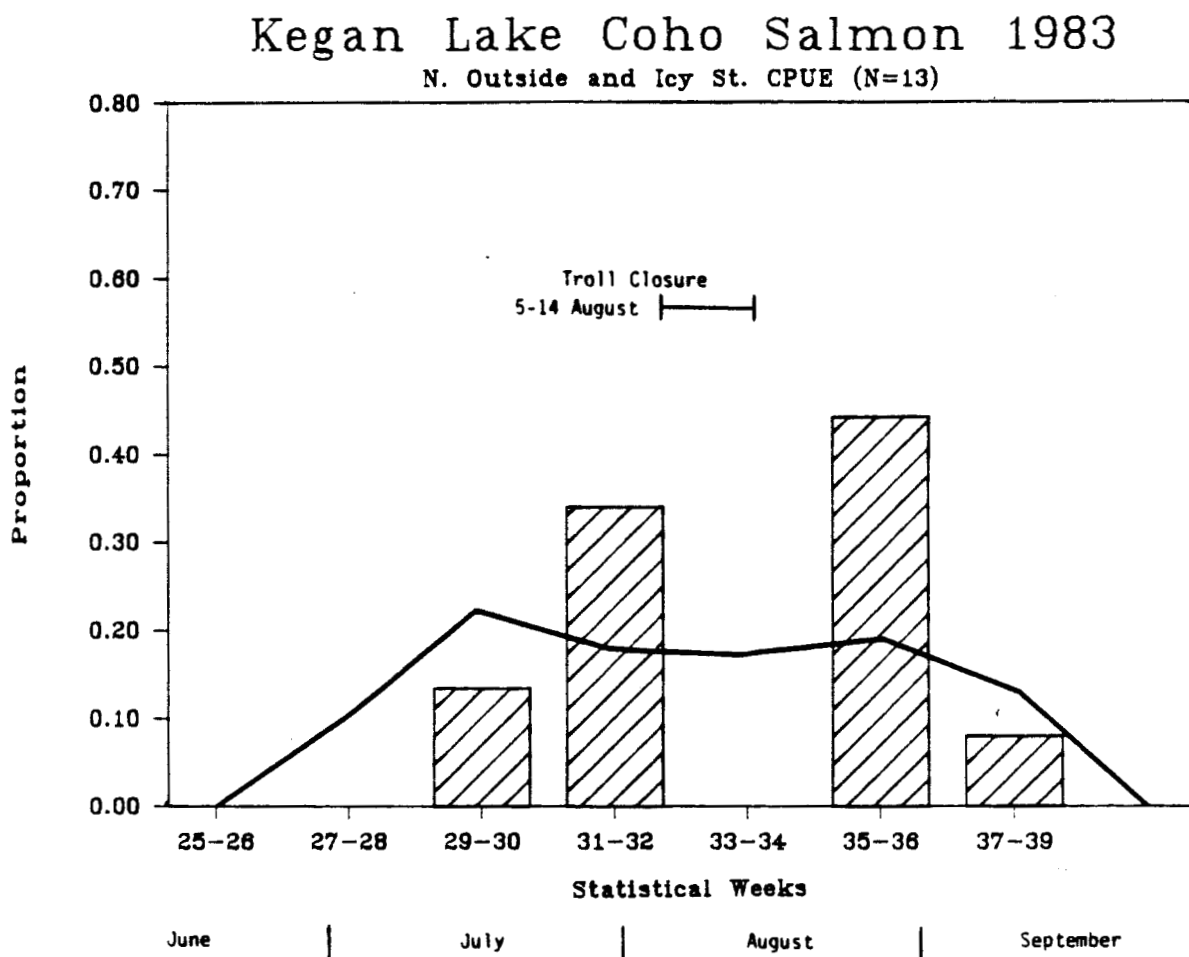
# Kegan Lake Coho Salmon 1983

N. Outside and Icy St. Catch (N=13)



Appendix Figure 43. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Kegan Lake coho salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

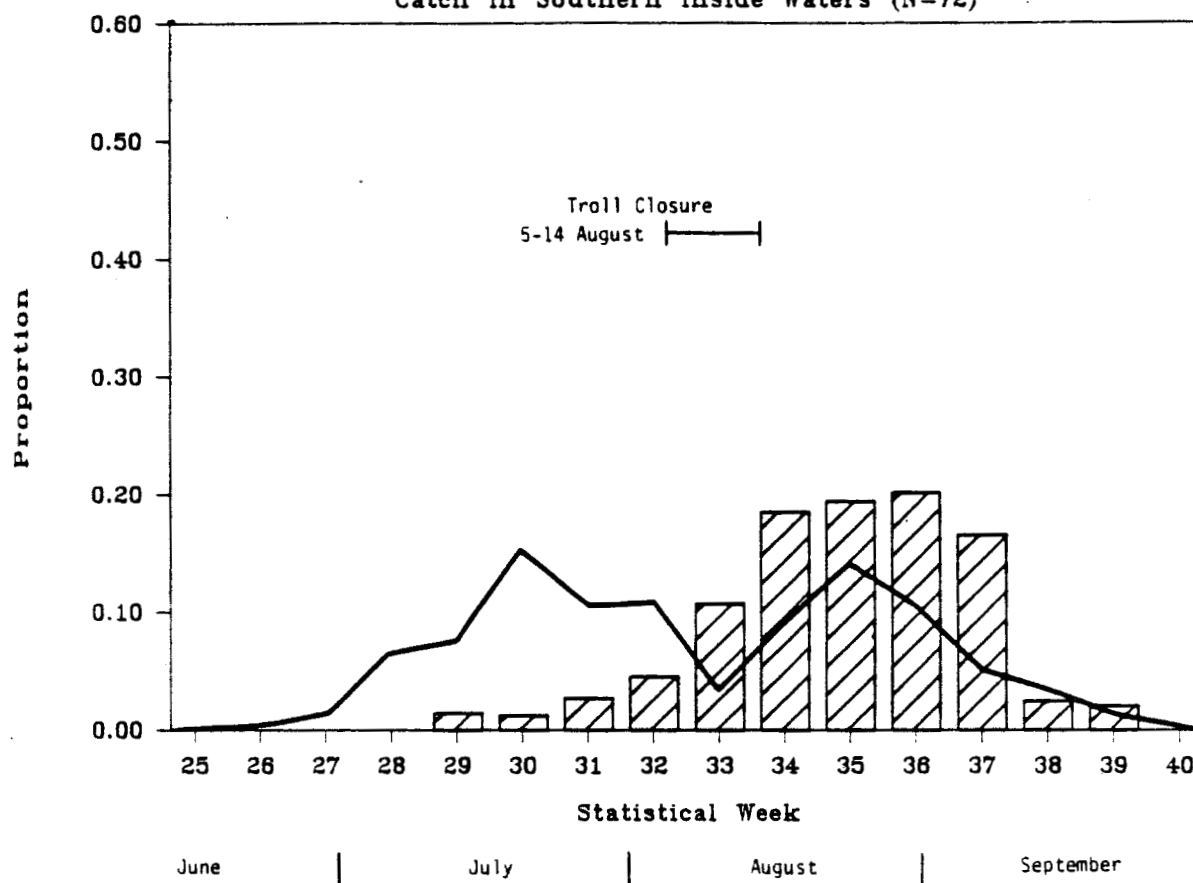




Appendix Figure 44. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Kegan Lake coho Salmon (bar graph) in Icy Strait and outside waters north of Helm Point, 1983.

# Hugh Smith Lake Coho Salmon 1983

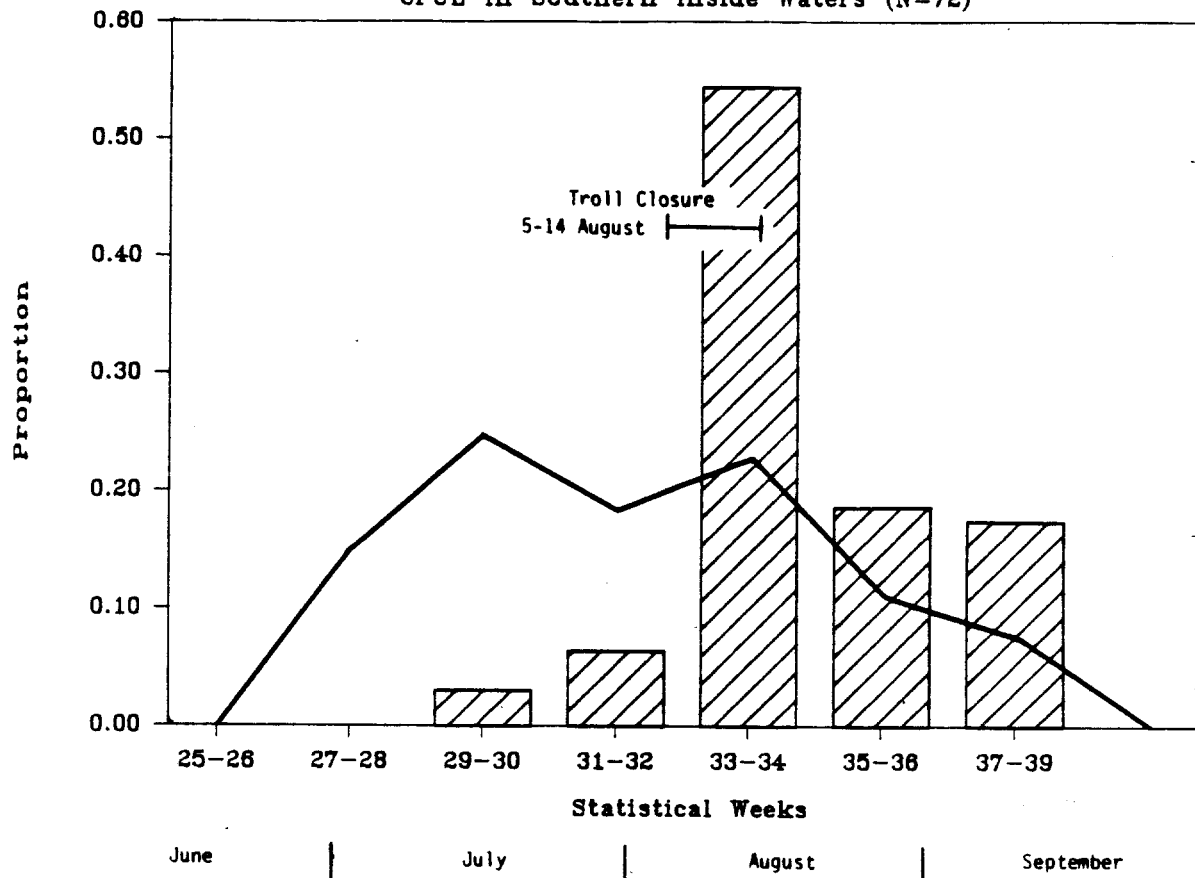
Catch in Southern Inside Waters (N=72)



Appendix Figure 45. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in Districts 101 and 102, 1983.

# Hugh Smith Lake Coho Salmon 1983

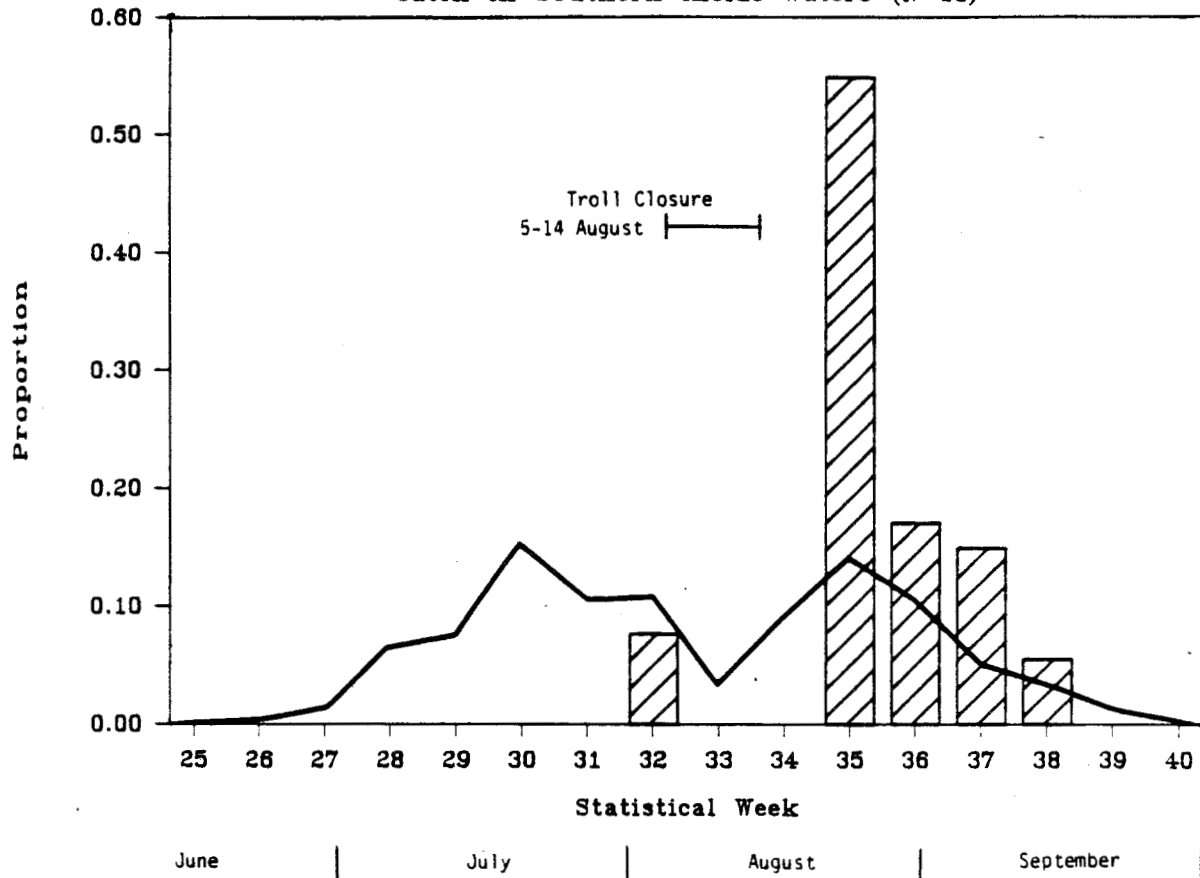
CPUE in Southern Inside Waters (N=72)



Appendix Figure 46. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Hugh Smith Lake coho salmon (bar graph) in Districts 101 and 102, 1983.

# Kegan Lake Coho Salmon 1983

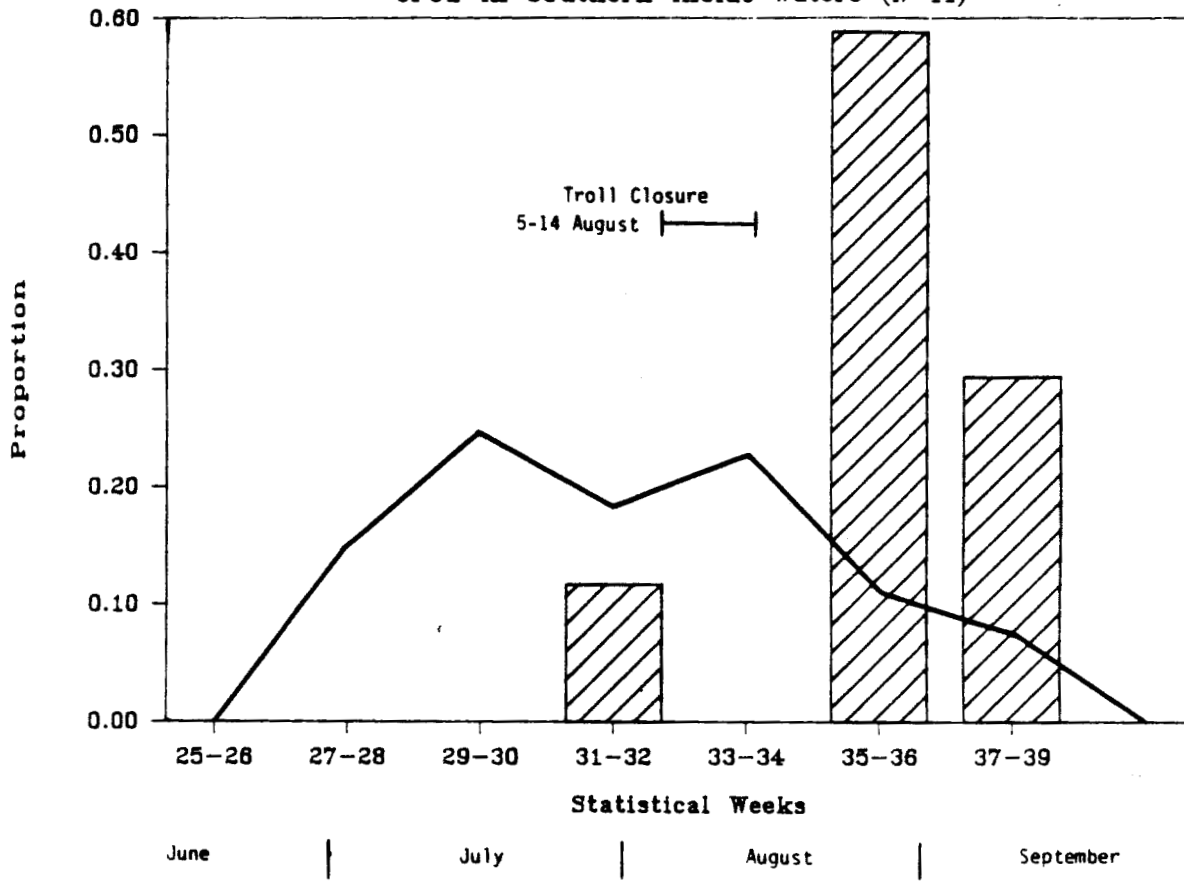
Catch in Southern Inside Waters (N=11)



Appendix Figure 47. Weekly proportion of the total coho salmon catch (line graph) and estimated catch of coded-wire tagged Kegan Lake coho salmon (bar graph) in Districts 101 and 102, 1983.

# Kegan Lake Coho Salmon 1983

CPUE in Southern Inside Waters (N=11)



Appendix Figure 48. Biweekly proportion of cumulative coho salmon CPUE (line graph) and estimated cumulative CPUE of coded-wire tagged Kegan Lake coho salmon (bar graph) in Districts 101 and 102, 1983.

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